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How Freight is Handled

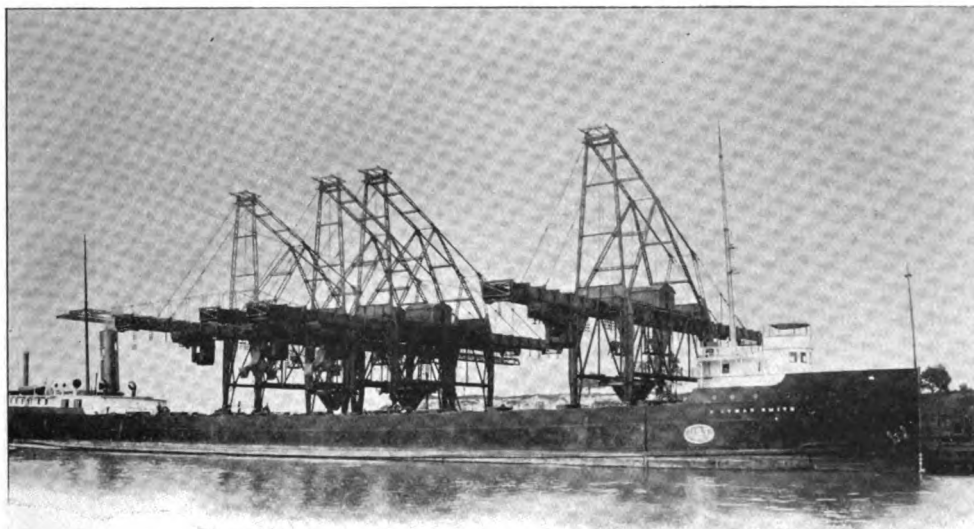
In the matter of handling freight in and out of vessels there is no place in the world that is comparable to the great lakes of North America, though any comparisons which may be instituted between the great lakes and any other part of the globe are unfair. The principal commodity which is handled on the great lakes is iron ore. Nature, as though it designed that the United States should be the leading industrial nation in the world,

planted enormous deposits of iron ore in one part of the country and then conveniently contributed a waterway of 1,000 miles to connect these deposits with the coal fields. Very little ore, practically speaking, is mined in the United States be-

yond that which comes out of the Lake Superior country. At any rate, the Lake Superior yield is fully three-fourths of the entire yield of the United States. There is enough of it to provide employment for great fleets of vessels year in and year out, so that a special type of vessel has been designed to meet it and special devices have been invented to load and unload these vessels. The trade is highly specialized; so much so that millions of dollars have been expended to save a penny in the handling of a ton of ore. The latter-day design of ships for this trade leave practically an unobstructed hold from the forecastle to the engine aft and this hold is entered by as many as thirty-three hatches, making an almost continuous trench out of the deck openings. This seeming structural weakness in the longitudinal section is compensated for by enormous arch girders extend-

ing underneath the deck between the hatches. This form of carrier has been specially designed to facilitate the loading of the vessel by means of chutes extending from great pockets in the ore docks. Broadly speaking no ore vessel is ever loaded directly from the cars. Cars are unloaded directly into the ore pockets of the dock, the docks having anywhere from 100 to 350 pockets with a storage capacity varying from

15,000 to 100,000 tons. When the ore carrier reaches the dock its cargo is invariably there waiting for it and it is only a matter of lowering the chute to have the cargo pouring immediately into the hold of the vessel. Phenomenal dispatch has



THE BROWN ELECTRICAL MACHINES AT CONNEAUT.

been obtained in loading vessels in this manner, the steamer Augustus B. Wolvin receiving a cargo of 10,000 gross tons in fifty minutes actual loading time. The loading of the ore carriers on the great lakes may therefore be said to have reached a stage of perfection. It is almost impossible to imagine any system whereby a vessel could be more speedily loaded with this bulk freight than through the medium of these great ore docks with their pockets and chutes.

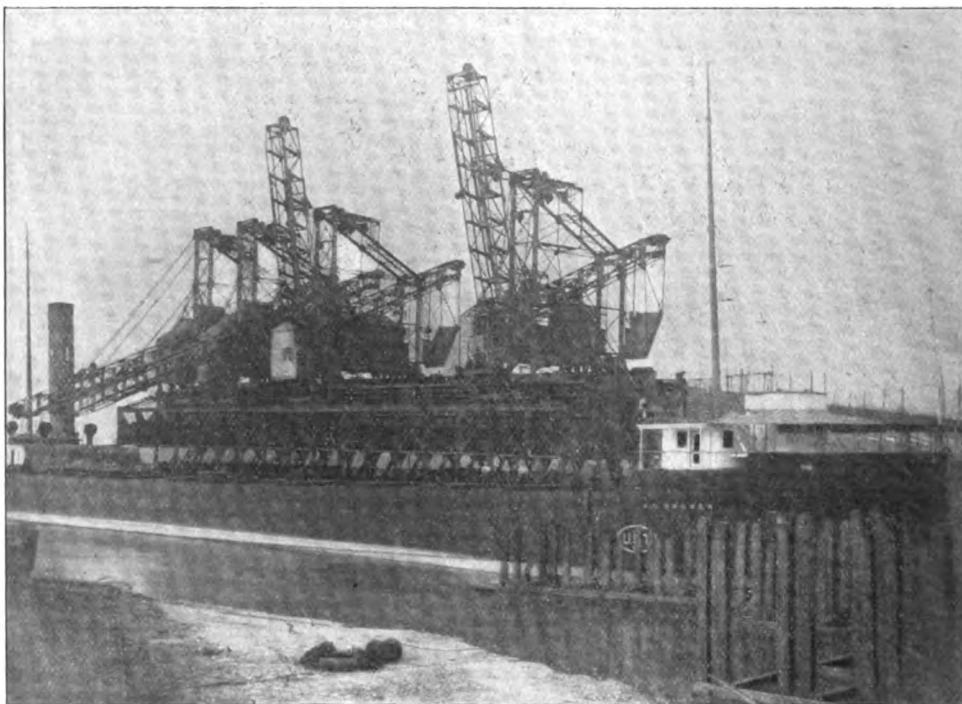
The problem of unloading these vessels is not so easy of solution. It has reached a facility, however, that is really the wonder of the world, but as it can be improved upon the end is doubtless not yet.

Less than forty years ago ore vessels were unloaded by means of wheelbarrows. As a rule the ore carried at that time were deck loads so that it was simply a problem of

shoveling it up on the barrow and wheeling it along the gang plank ashore. Whatever ore was carried in the hold was hoisted to the deck by horse power and then wheeled ashore. In 1867 little deck engines were installed to take the place of horses and the invention was considered a wonderful improvement. In fact it was considered so revolutionary by some masters that they insisted upon having the horses until

the superiority of the engine was manifested to them by the dispatch with which vessels employing it could be unloaded and clear again for upper lake ports. As the channels were deepened and the vessels consequently grew in size, the problem of unloading became a serious one. It was attacked by Mr. Alexander E. Brown with a great deal of energy and with the result that the Brown hoisting and conveying machine was designed to meet this special purpose. Since then other rigs have been invented including the Hoover & Mason equipment and the Hulett machines with clam shell buckets, so that remarkable dispatch in unloading has now been secured. In this connection it is interesting to observe that vessel designers on the great lakes have actually adapted the design of vessels to the unloading equipment installed upon the docks. In some parts of the world vessels engaged in the ore trade carry their own unloading equipment with them, that is, they have a deck installation; but on the great lakes the unloading equipment is exclusively the function of the dock.

In order to show clearly how dispatch in unloading has been developed on the great lakes, it is only necessary to refer to the record established by the steamer Augustus D. Wolvin at Conneaut last July. The dock of the Pittsburgh & Conneaut Dock Co. at Conneaut is equipped with four Hulett clam shell machines and four Brown electrical machines. These eight machines worked upon the Wolvin. The actual time that the Wolvin was under the machines was 4 hours, 30 minutes, or from 7:22

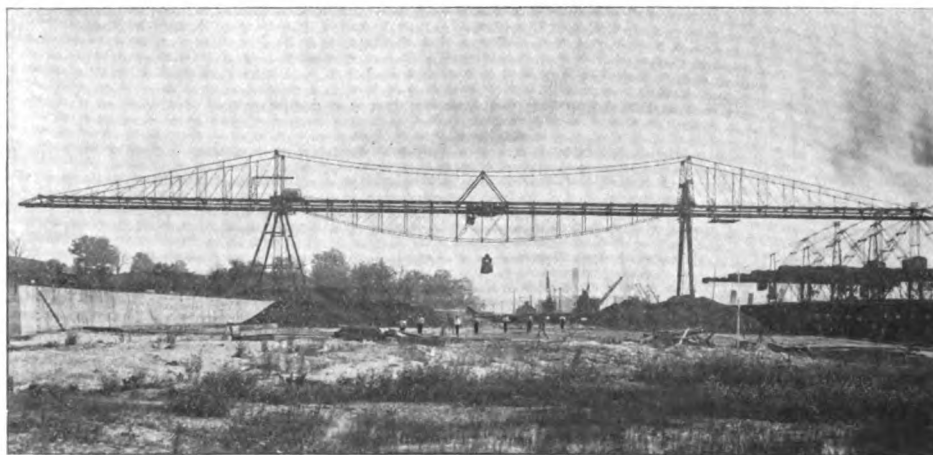


THE HOOVER & MASON MACHINES ON THE ERIE DOCKS AT CLEVELAND.

tons by the No. 3 Hulett machine. During the last hour of this time fifty men were employed in the hold of the ship working the ore away from the sides of the vessel in order to facilitate the unloading buckets. This record established by the Wolvin was, of course, made under special conditions but it is by far the best record yet obtained on the great lakes. Last year these four Hulett machines took out 5,200 tons of ore from the steamer James H. Hoyt in 3 hours, 52 minutes, but on the Wolvin, as noted, they discharged 7,257 tons in precisely fourteen minutes more time than they allowed the Hoyt's cargo. Nowhere else in the world could 9,945 gross tons of ore have been taken out of the hold of a vessel in this brief space of time.

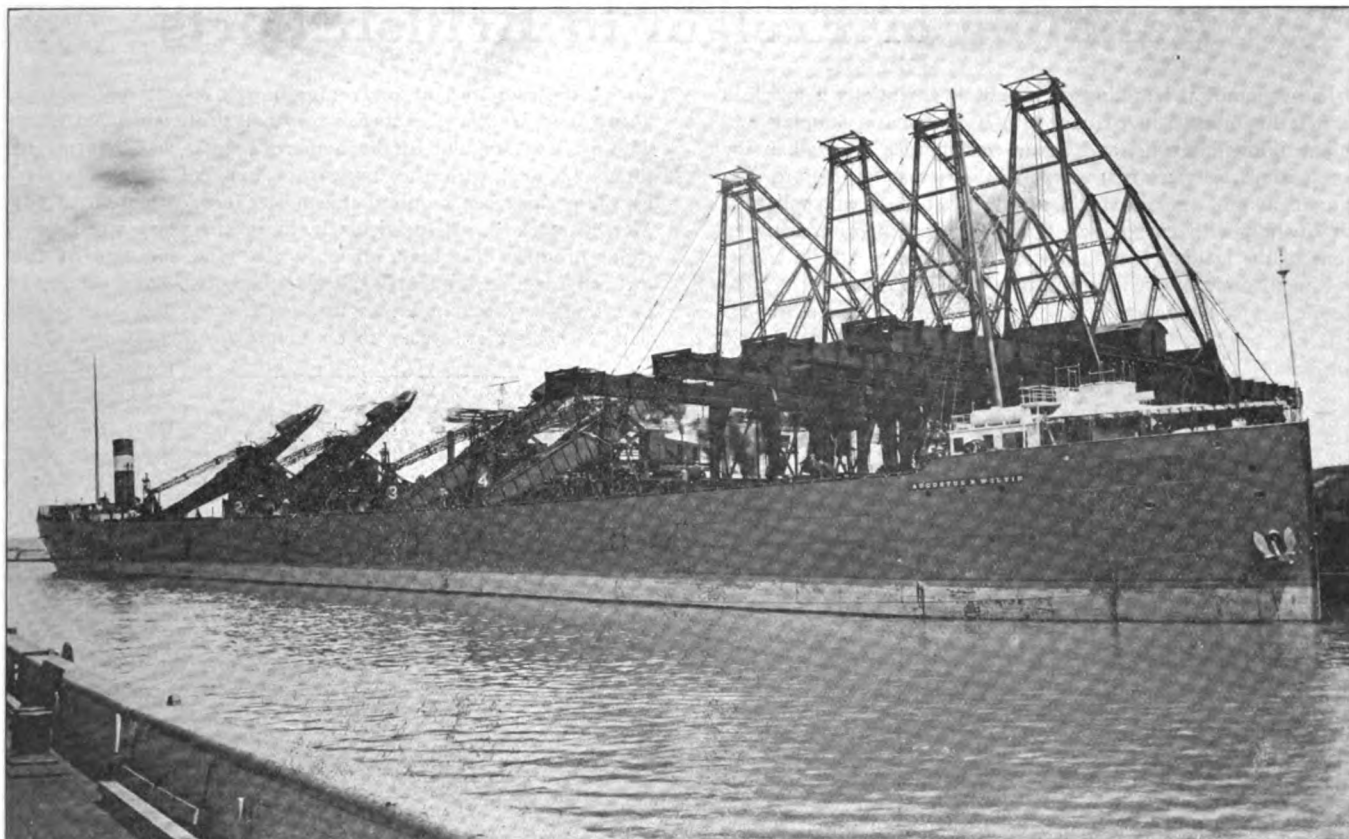
It is the testimony of those that have dealings on the coast that the terminals at the coast ports are not what they should be. Vessels are still unloaded at nearly all of the eastern cities by slow and cumbersome methods. This is, of course, in a measure due to the mixed cargo that coastwise vessels carry and the conditions under which the companies are obliged to handle freight. But even granting this, there is room for much improvement. Probably no man in the country

has given greater attention to the handling of freight at receiving ports than Mr. Alexander E. Brown, and it is his opinion that a ship designed upon common sense lines for the carriage of bulk freight on the ocean has not yet been designed. He also believes that the field for the application of modern facilities for unloading at



THE BROWN CONVEYING MACHINE AT CONNEAUT.

A. M. until 11:52 A. M. The average time that the four Hulett clam shell machines were working upon her was 4 hours, 6 minutes, during which time they took out 7,257 gross tons of ore. The average time that the Brown electrical machines were working upon her was 3 hours, 41 minutes, during which time they took out 2,688 gross tons. The maximum amount taken out in any one hour was 681



THE FOUR HULETT CLAM SHELLS AND FOUR BROWN ELECTRICAL MACHINES ESTABLISHING THE UNLOADING RECORD ON THE GREAT LAKES ON THE STEAMER AUGUSTUS B. WOLVIN.

coast port terminals is practically a virgin one. It is not an uncommon thing for a vessel on the coast to take days to unload, while on the lakes such a performance would be only a matter of hours. A canvass of all the coast cities shows the same general lack of facilities for unloading freight, though there are a number of excellent devices for fueling vessels rapidly.

DE MAYO'S FUELING DEVICE

Because of the crowded conditions of the docks of New York harbor the problem of economically coaling the big transatlantic liners while lying at their berths has always been difficult of solution. Last August at pier 15 North River a successful device was in operation alongside the steamship Philadelphia, and to all appearances the contention of the inventor, L. A. De Mayo, stevedore of the American Line, were made good. For twenty-six years Mr. De Mayo has occupied his present position, and in this time watching his men unloading thousands upon thousands of tons of fuel into the bunkers of the outward bound liners he has formulated the plans of the electric elevator now in operation.

Water space between piers is now so valuable along the water front that a cumbersome floating elevator was out of the question on any form of barge which could not pass under the breasting shores which extend from the sides of the steamship to the dock.

Compact and weighing only 2 tons, the De Mayo elevator is 24 ft. long—high, as it stands on end—and approximately 3 by 3½ ft. in other dimensions. Twenty-seven pockets, each carrying 35 lbs. of coal when level full, are fastened by hinges and form an endless belt. The truss-like structure is open at the bottom, which allows the moving pockets to dig into the fuel in the hold of the ordinary harbor coal barge.

It is the electric motor enclosed in the elevator that gives to Mr. De Mayo's invention its mobility of operation. Sus-

pended by ordinary tackle the elevator can be moved to any part of the loaded coal barge, a wire connecting with the pier for the power for the motors being all that is necessary from the land side. A telescopic chute conveys the coal from the dumping point of the pockets to the side port of the steamship.

Run at full speed, the elevator discharges 100 tons of coal an hour with a crew of five, consisting of an attendant at the starting box of the motor on shore, two shovelers on the barge and two trimmers in the ship's bunker. Four elevators can be used at one time, two on either side of the ship, and Mr. De Mayo said he could coal the biggest of the express liners, the great coal burners, in ten hours.

With the universally used steam-hoisted buckets seven men now handle fifteen tons an hour.

"With the best of care," said Mr. De Mayo, "at least 75 tons of coal are lost overboard alongside the liners in coaling in the course of a year. As you see, not only is every lump put on board, but there is no dust, and the demand of the steamship of today is absolute cleanliness as far as possible. The narrow harbor barges with open loads, carrying about 400 tons of coal, are perfectly suited for the use of the elevator, and thus all available dock space is left free for the handling of the cargo, which comes to the ships mostly in lighters."

Mr. De Mayo, who is connected with the International Mercantile Marine Co. of New York, has formed the De Mayo Coaling Co. to put the device upon the market.

The four-masted schooner E. Starr Jones was launched from the ship yard of Dunn & Elliot, Thomaston, Me., and was named by Miss Ida Elliot. The schooner is 175 ft. long, 38 ft. wide and 19 ft. deep. The auxiliary equipment of the schooner was complete throughout, including Hyde windlass, patent anchors and pumps.

Handling of Freight in British Ports

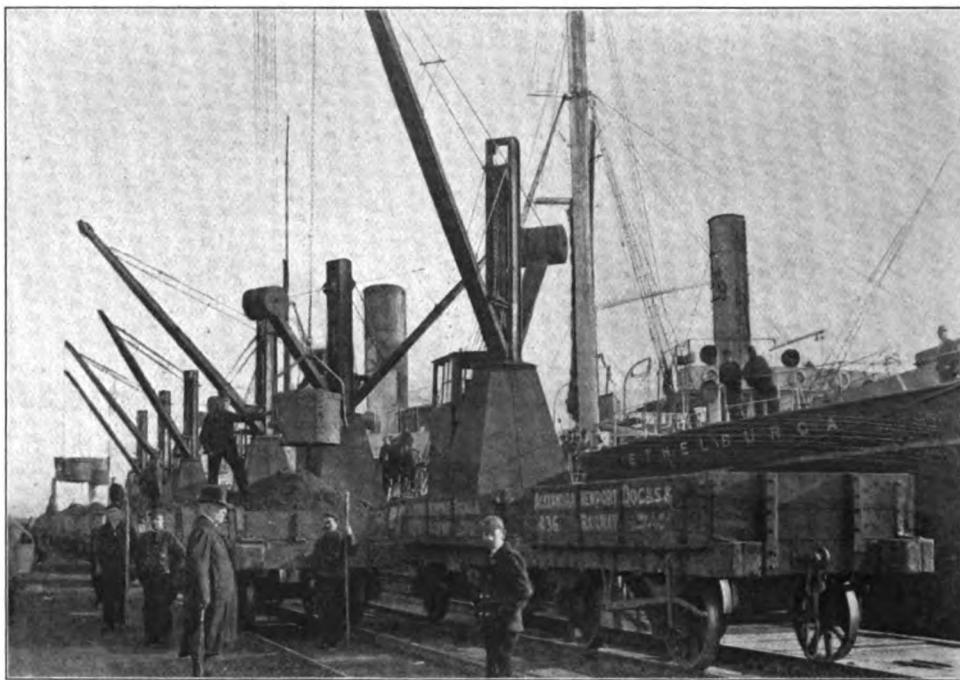
The economical handling of freight is essentially a question of first importance to Britain with its extensive shipping and ship building interests, and never was there a time when the port authorities were more alive to the necessity of up-to-date equipment and the provision of the most modern appliances for dealing with cargo than now. The competition between some of the leading British ports, all anxious to attract traffic, and incidentally increased revenue, has doubtless to a great extent influenced this result, but at the same time there has not been wanting that local enterprise among the several port authorities to

keep their docks and harbors abreast of the times and efficiently equipped in order that the products of the world brought to them for home consumption, and distribution among other nations of the earth, through the medium of British shipping, should be economically and expeditiously dealt with by the most perfect and modern facilities available.

And those that stand in the front rank in this respect are the dock authorities of the Mersey, the Thames, the Clyde, Bristol channel and the Tyne. The Mersey Docks and Harbor Board merit the first place because it enjoys the reputation among British ports of giving the greatest dispatch to all manner of shipping from the largest ships afloat down to the merest tramp or coaster, and that as a consequence of the forward policy pursued by the dock board, particularly during the last decade, and the up-to-date equipment there provided. While London owns more ships than Liverpool, yet Liverpool has almost 600,000 more registered tonnage than London, and some idea of the traffic passing through Liverpool may be gathered from the fact that last year Liverpool tonnage carried 27 per cent of the entire foreign and colonial trade amounting to \$1,220,000,000, out of a total of \$4,515,000,000 imports and exports of the United Kingdom. With regard to the trade with the United States, the Mersey port maintains her status as the premier port of the world both as to imports and exports. In ships between Britain and the republic the Mersey port has over one-fourth, in tonnage it has almost one-half. The three largest ships in the world have there home port in Liverpool, and very soon when the new express turbine Cunarders are ready she will recover the blue ribbon of the Atlantic. And as a further proof of the greatness of Liverpool's shipping it may be added that for the year ended June 30 last, the approximate total tonnage entering and leaving the Mersey reached the huge total of 31,252,482 tons. There were docked or undocked in Liverpool

during the same period an average of 139 vessels, aggregating 85,620 tons net daily, exclusive of small craft which on some days pass in and out of the numerous docks like swarms of flies. To deal with the immense volume of freight carried by these ships has required the most careful attention of the Mersey dock board, particularly in recent years when such rapid progress has been made in the type and size of the modern cargo carrier and the leviathan passenger ships. It is safe to say that not less than \$30,000,000 has been spent within the last six years to accommodate these both as re-

gards new docks, dock extensions, graving docks and general equipment for handling and storage of cargo. The port of Liverpool holds the distinction of shipping a larger quantity of coal for ships' use on foreign vessels than any other port in the British Isles. There are twenty-one coal shipping appliances at the board's docks, viz.: nine at the High Level coal railway,



THE STEAMER ETHELBURGA DISCHARGING IRON ORE AT ALEXANDRA DOCKS, NEWPORT, BRISTOL CHANNEL, SHOWING SIX HYDRAULIC CRANES AT WORK AT THE SAME TIME.

Bromley, Moore & Wellington docks, two at the Herculanum dock, and ten at Birkenhead, the capacity of which varies from 100 to 300 tons per hour. The total quantity of coal shipped at these appliances, both as bunkers and as cargo during the year 1903 was 2,581,361 tons. Over 1,000 tons of coal have been shipped and stowed by one of the coal hoists at Birkenhead in 3 hours 45 minutes, being at the rate of 227 tons per hour, whilst as much as 354 tons per hour have been similarly dealt with by one of the Herculanum coaling cranes. Every well equipped port must be liberally provided with cranes, and along the 35 miles of quays which the Liverpool and Birkenhead docks can boast of, there are over 120 fixed cranes, mostly worked by hydraulic power, situate in convenient positions about the docks, and varying in power from 1 to 100 tons power. The board have also provided three floating cranes, similar to the accompanying illustration of the Hercules, one or other of which is capable of dealing with any weight up to 100 tons. There has been such a demand for these floating cranes that the board have ordered another (the Samson) of 30 tons power. They are principally used to convey to and load into outgoing vessels large and heavy lifts, such as boilers, etc., thus saving the vessel the necessity of changing berths to go under one of the fixed land cranes. The Mersey board have also in recent years paid special attention to the erection of sheds around the docks. These sheds cover an area of 172 acres, of which double story sheds represent about 47 acres. These double story sheds are equipped with about 100 30-cwt. moveable roof cranes placed

on the dock side roof of the shed for the purpose of taking goods out of the vessels' holds and landing same on either floor of the shed. On the land or road side of such sheds, 20-cwt loading-off wall cranes, in addition to an immense number of hand lowering jiggers, are provided to facilitate the loading of goods into vehicles for removal to warehouse or railway depot. While the port of Liverpool cannot boast of such rapid discharge as on the great lakes, where a record which will be hard to beat was established in the case of the

took on board before sailing again for New Orleans 2,000 tons of coal and 4,200 tons of cargo. Just one more recent instance of rapid and economical handling of freight at Liverpool. As recently as Nov. 11, the Leyland liner Norseman from Galveston with 30,905 bales of cotton arrived at Liverpool, and completed the discharge of this large cargo in thirty working hours, working seven hatches and seven gangs of men. As soon as she finished, the steamer Atlantian of the same line commenced to discharge with equal facility in the



DISCHARGING CARGO FROM THE WHITE STAR STEAMSHIP TEUTONIC, CANADA BRANCH DOCK, LIVERPOOL.

Augustus B. Wolvin, yet one recent instance of quick dispatch is worthy of mention, and may be taken as characteristic of the up-to-date facilities at the Mersey port. The discharge of the cargo of the steamer Indian, 5,991 tons net, belonging to the Leyland Line, and which consisted of 23,347 bales of cotton and 200 tons of timber, was commenced at seven o'clock on Monday morning, Oct. 10 last, and continued until nine o'clock at night—thirteen working hours—in which time 14,454 bales of cotton and twenty-six logs of timber were landed. The discharge was resumed at seven o'clock the next morning and was completed at six o'clock that night. The total working time occupied was thus twenty-three hours, equivalent to a rate of discharge well over 1,000 bales per hour. The cotton was weighed as landed. The deliveries off quay were quite in keeping with the discharge, for by Tuesday night 15,000 bales had been disposed of, and by the time of the Indian's sailing at noon on Friday, Oct. 14, not a bale of her cargo remained. Besides the cargo discharged, she

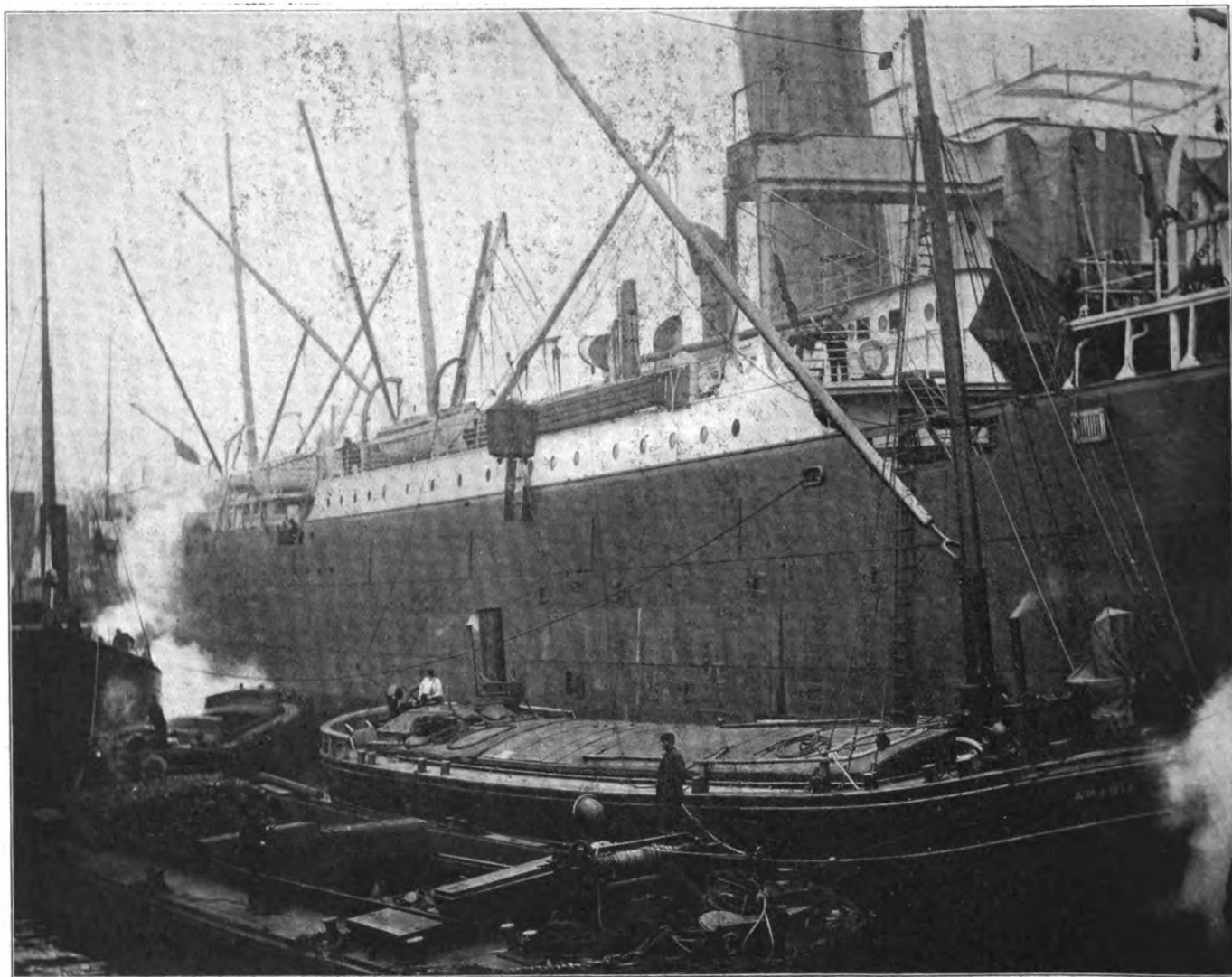
Norseman's vacated berth a cargo of 20,548 bales of cotton, and 600 tons of general cargo. It is questionable if in any port in the world such handling of ships and their immense cargoes could be so expeditiously accomplished as in Liverpool, yet events such as the above are treated as every day incidents in the routine of the port of Liverpool at the North docks.

THE PORT OF MANCHESTER.

Looking back over the ten years that have elapsed since the Manchester ship canal was opened, one cannot but be impressed by the magnificent services which it has rendered to Manchester and Lancashire and by the wonderful success which has been achieved in the transformation of an inland city into a great ocean port, competing, and competing not in vain with the greatest ports of the country. For the port of Manchester has been pitted not as Glasgow was, against some old fashioned rival; she has had to measure herself against Liverpool, a veritable giant amongst the seaports of the

world. For every kind of traffic which she sought, Manchester has had to offer facilities as great as, or greater than those of Liverpool, otherwise the traffic could not have been obtained. So high a standard set up, and so great a measure of accomplishment in a single decade cannot fail to strike the imagination. One more point is that the construction of the Manchester ship canal, and the building of the Manchester and Salford docks have put both the import and export trades of Manchester upon a more solid foundation, and a closer and

a record as far as timber imports are concerned. The advantages in favor of a timber wharf near to the Manchester docks have already become recognized mainly through better accommodation provided and the gain per cent ex-Manchester docks as compared with Liverpool. Another important development is the Manchester Corporation lairages and foreign animals wharf. The site is 12 acres in extent with wharfage on the canal of 800 ft. and a frontage of 850 ft.. This site is particularly well suited for the purpose being away



COALING A WHITE STAR LINER AT LIVERPOOL

more regular relation with the world's market than ever before. The wise foresight and commercial sagacity of the directors of the Manchester ship canal in securing special railway rates to all the commercial centers of Great Britain has been an asset second only in value to the canal itself. And in regard to the cheap and rapid handling of cargo it is not one whit behind Liverpool, indeed its perfect facilities for dealing with cargo is one of the main reasons why so much traffic is going to Manchester, and settling there as an established trade. One of these is that of the import of petroleum, and at present there are no less than eight different petroleum supplies north and south of the canal near to the docks, the total tankage capacity at or adjacent to the docks being 70,708 tons or 19,758,412 gallons. Oil is conveyed to each of the depots through pipes direct from the vessel to the tank, whence it can be reloaded into carts, barges or railway wagons. Another trade which is fast finding a home at Manchester is timber, and the season of 1904 will doubtless show

from the bustle of general business and having at the same time the advantage of direct and convenient approach. The canal at this point is 300 ft. wide. The appliances include machinery for refrigerating, electric lighting and pumping, and railway sidings and roadways communicate with the various parts of the depot. The completion of these premises enables foreign cattle to be landed and dealt with at Manchester the center of the area of consumption. The present capacity (which can be trebled) is 1,000 beasts, and the corporation have made arrangements to increase the capacity in order to accommodate a further 600 head of cattle. One of the most important provisions for the rapid dealing with cargo on the Manchester ship canal is without doubt the grain elevator at Trafford wharf of 40,000-ton capacity, probably the finest building of its kind in the country. There is sufficient depth of water for ocean going steamers to berth alongside, and the following operations can be performed simultaneously: (a) Discharging from vessels in the dock at the rate

of 350 tons per hour; (b) weighing in the tower at the water's edge; (c) conveying to the house and distributing into any of the 226 bins; (d) moving grain about within the house for changing bins or for delivery and weighing in bulk at the rate of 500 tons per hour; (e) sacking grain, weighing and loading sacks into forty railway wagons and ten carts simultaneously and (f) conveying from the elevator into barges or coasters at the rate of 150 tons per hour if in bulk or 256 per hour if bagged. An important feature in the elevator is Metcalf's patent dryer, used in America with most satisfactory results. The dryer is capable of drying 50 tons of grain at each operation, and grain can be moved to or from the dryer from or to any bin in the house. A powerful pneumatic apparatus capable of discharging 200 tons per hour from ships into the elevator is provided to supplement the foregoing appliances. Another branch of shipping on the Manchester ship canal which is provided with the most perfect and economical equipment is that of the Partington coal basin, which has a quay space of 20 acres, length, half a mile; water space $5\frac{1}{2}$ acres, and 15 miles of railway sidings. There is accommodation for six tips, four of which are constructed and fitted with hydraulic machinery and all the latest improvements for loading coal, about 160 tons per hour can be loaded from each tip. There is direct railway communication with both the South Yorkshire and Lancashire coalfields. And the Manchester Ship Canal Co. have on many occasions given evidence of their ability to discharge cotton and other cargo rapidly. During the month of October this year the *Ausilma de Larrinaga* completed her discharge of 12,066 bales of American cotton having worked only 22 hours. To the uninitiated this may not appear to compare favorably with their discharge of the steamer *Samoa* with 19,758 bales of cotton and 630 tons of other cargo and which was unloaded in 32 working hours, but the latter steamer has six cargo hatchways, whereas the *Ausilma de Larrinaga* has only four and from one of these no less than 1,508 bales were landed in nine hours on Oct. 7. Another instance of rapid discharge and handling of cargo at Manchester may be found in the case of the steamer *Matina* which recently arrived with about 40,000 bunches of bananas from Costa Rica. The discharge of the steamer was commenced at 8 A. M. on the Monday morning, and before ordinary working hours had expired at 6 P. M. on the same day (or nine working hours) the whole of the fruit had been discharged from the vessel and forwarded by rail, cart and coastwise steamer to all parts of the kingdom, only a small portion being retained in the store at the docks for ripening purposes. Here are the figures of some of the principal imports into Manchester for the year ended Dec. 31, 1903: Lumber 281,465 tons, grain 374,854 tons, cattle 49,707 head, tank oil 31,438,633 gallons, and cotton (season 1903-4) 523,081 bales. The new dock now in course of construction, and which is expected to be ready for traffic next summer, together with its auxiliary works will perhaps further bring the port of Manchester into prominence on account of its efficient equipment. The dock itself will be the mean length of 2,700 ft. and of a width of 250 ft. The water area of the dock will be 15.5 acres with surrounding quay space, roads, railways, etc., of 32.6 acres. In the formation of the dock, the conventional type of solid wall has been departed from and when finished each will present an appearance similar to that of a large viaduct crowned with an exceptionally high parapet. A considerable saving in first cost has been effected by the adoption of this design which in addition to possessing technical advantages during construction will, it is anticipated, lessen the ranging of vessels moored at the wall when passed by steamers on their way to or from their berths in the docks. The southerly side of the dock is being equipped with a series of five transit sheds for the receipt of cargo from or for vessels. These five sheds will form one of the systems, if not the largest system of transit

shed accommodation in the world. Four of the sheds will be 425 ft. long the fifth or central shed will be 450 ft. long, whilst the width of each shed will be 129.5 ft. over all. The transit sheds will be four floored, including a flat roof, therefore a very large area of quay space will be provided for handling traffic, the total floor area of the whole of the sheds being about 195,000 sq. yds. The sheds are being constructed entirely of ferro-concrete on the Hennebique system. In this system the columns, walls, girders, floors, roofs, in fact the whole of the structure is formed of steel rods embedded in Portland cement concrete. The system has been adopted for the transit sheds mainly because of the exceptional properties for fire resistance which the material possesses. The northerly side of the dock will be laid out for the open storage of cargoes, and ample provision in the way of paved quays and roads, railways, crane roads, etc., has been made around each side of the dock. To the southward of the new dock an area of some 67,480 sq. yds. of ground has been set apart for railway sidings of which there will be when completed nearly nine miles. One-half of these sidings are being constructed by the Manchester Ship Canal Co., and the other by the Lancashire & Yorkshire Railway Co., as the easterly end of the sidings will terminate at or near the junction of the Lancashire & Yorkshire Railway Co.'s system with that of the Manchester Ship Canal Co. In addition to the dock now under course of construction, the canal company has set apart land for the formation of a similar dock to be known as No. 10 dock, which will be north of that which is dealt with here and of about the same dimensions. With these additional dock-works complete there will be few dock systems in the country equal in capacity and general "up-to-dateness" to those in connection with the Manchester ship canal.

BRISTOL CHANNEL.

Another British port where may be found a model of enterprise and efficiency in economical handling of freight is Newport and Cardiff and Avonmouth in the same estuary are both on a par with it. Newport and Cardiff are two of the leading coal ports of the kingdom, but Newport in addition possesses many important industries in the engineering and general manufacturing trades and is the center for the numerous large iron works established on the coal fields. As an example of Newport's progress as a coal exporting port, the following comparative statement of the shipments over ten years may be quoted: 1890, 2,765,294 tons; 1899, 3,829,729 tons; increase 1,069,426 tons or over 38 per cent. The imports and exports of Newport were 1891, 3,674,476 tons; 1899, 5,875,817 tons; increase, 2,201,341 tons, or 59 per cent. The Alexandra Docks & Railway Co. own the three docks at Newport, all of which are entered from the river, and are provided with the following appliances: Hydraulic hoists, 17; movable hydraulic cranes, 18; fixed hydraulic cranes, 6, and traveling steam cranes, 5. The hydraulic hoists have a maximum lift above quay level of 40 ft. and the cranes range up to 40 tons. As the shipment of coal forms one of the characteristics of the port, it may be of interest to give the following facts. The highest vessel can be loaded or bunkered with the greatest facility, and dispatch can be given with certainty. Large quantities of coal,—40,000 to 50,000 tons—can be stored in railway wagons on the sidings ready for immediate shipment. As there are three lines leading to each tip, in case of "mixing" there is no necessity for marshalling in a cramped space and under pressure of work. The method of tipping tends still further to promote dispatch. The loaded wagon is run along a low level road on to the hydraulic hoist, then lifted, and tipped into the ship. The empty wagon instead of again being lowered to the level it started from is returned on a high level road. This system enables the work to be carried on in a steady and uninterrupted manner. The only limit in practice is the necessity of trimming cargoes

in the hold, and the use of auto-breakage cranes and boxes in lowering the first portions. Wagons are retared without extra charge. The arrangements for securing, weighing (which is done alongside ship) reducing breakage and so on are of the most complete character. Shipping is carried on continuously by day and night and there is no extra charge for night labor. Coal shipping is also carried on at hoists on two river jetties which are suitable for small vessels engaged in the coasting trade up to 200 tons net register. Newport is the second largest coal exporting port in South Wales. Dock and port development seems to be the order of the day in the Bristol channel, and after noting with jealous eye the extensions and improvements that have taken place at Bristol, Newport on the other side of the channel is now engaged in following the examples so worthily set. The Alexandra Docks & Railway Co. have already in course of construction a new quay and other extensions for which they obtained powers in the last parliamentary session, and now they propose to construct and equip wharves from the northern entrance of the Alexandra dock to the old Cork Steamship Co.'s stage, so as to expedite the loading and discharge of ships berthing in the river Usk. The outward general cargo trade has seriously suffered of late through lack of accommodation, and the dock company realize that they must strike out boldly in order to find facilities for coping with the vast accession of trade their policy has created. It is reported that the Powell-Duffryn Colliery Co., which at one time used to ship the bulk of its output at Newport, but which of recent years has rather favored Cardiff, is about to transfer its traffic back to Newport. This will mean an addition of something like a million tons of coal per annum to be exported from the Usk side port, and as the export trade generally has been gradually increasing, it is confidently expected that the total export trade will amount to something like six or seven million tons a year. As Newport is also the port of entry for the bulk of the half-finished material in iron and steel "dumped" into this country, it can safely be argued that the trade of this port has taken an upward turn.

The Thames, the Tyne and the Clyde, it need not be added, are places that stand in the very front rank of British shipping, for does not the port of London boast of being the first in the world, and Newcastle and Glasgow have world-wide fame for their ship building. But I have purposely selected Liverpool, Manchester and the Bristol channel as examples of what Britain is doing in the way of economical handling of freight, for the most perfect and latest appliances I am convinced are in use at these ports, and they are perhaps the most go-ahead of those I have named. Possibly, at a later period, it will be possible to deal with those ports I have omitted in this article, and illustrate the special features peculiar to them.

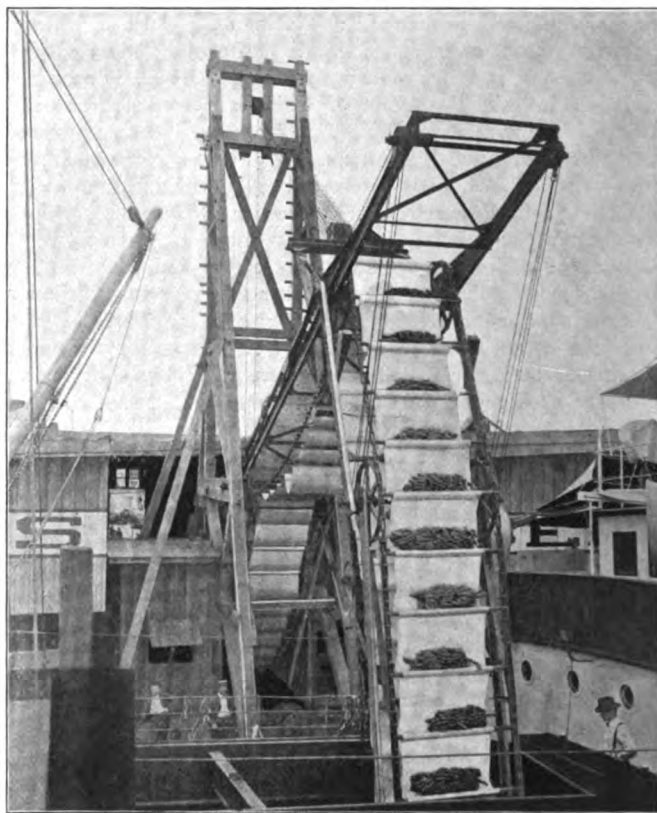
ON NORTH GERMAN LLOYD BOATS

Concerning the handling of cargo on its great fleet the North German Lloyd Steamship Co. writes: "The North German Lloyd steamers are combined passenger and freight boats. Owing to the construction of these boats the freight handling can hardly be compared with the lake boats. The passenger steamers have no side ports for discharging and loading of cargo. All the freight has to be handled through the deck hatches into and from the lower hold of the steamer. The work is done partly by steam and partly by electric cranes and for the hoisting of the freight rope slings are used. The passenger steamers, such as our steamer 'Kaiser Wilhelm II,' 19,361 registered tons, the fastest ship in the world, handles very little cargo, as the space in the lower holds is almost entirely taken up by her engines and boilers and her coal supply of over 5,000 tons for one crossing of the transatlantic ocean. The coal is taken on board through small side ports. In New York the coal is hoisted in buckets of 500 lbs. each

and dumped into the side ports and in the German ports the coal is either hoisted in buckets or sometimes carried in wheelbarrows from the railroad car and dumped through the side ports. In Asiatic ports the passenger steamers are coaled by an army of men and women who carry the coal in buckets or baskets of 15 to 25 lbs. and dump these through the side ports. This latter method is a most expeditious way of coaling."

HANDLING BANANAS ON BOARD SHIP

The United Fruit Co. has a fleet of about eighty steamers constantly delivering bananas from various points in the tropics to different points in the United States. The company handled 75 per cent of the fruit imports of 1903, a total of 3,000,000 bunches or about 3,000,000,000 bananas. This trade,

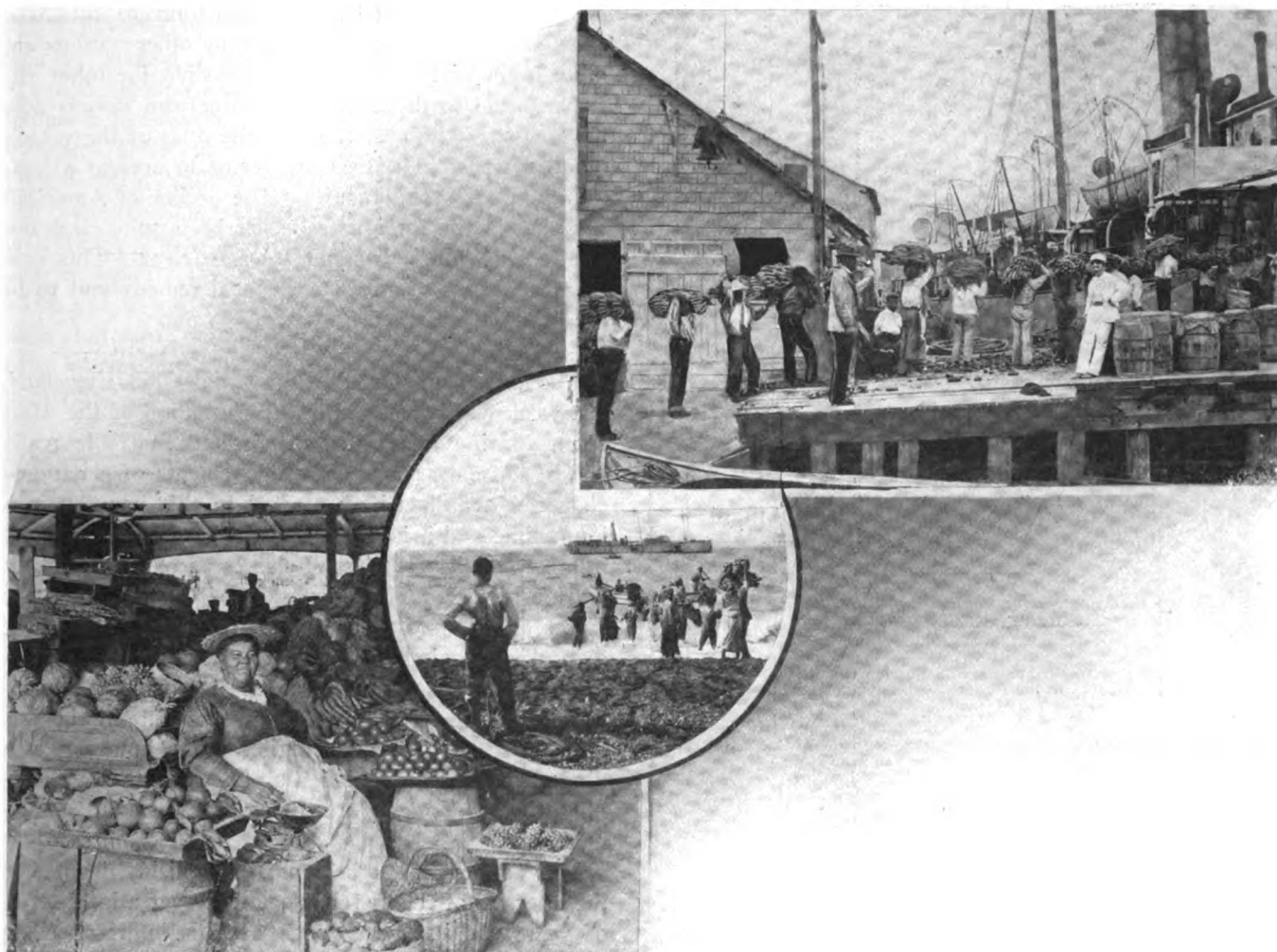


UNLOADING BANANAS BY MACHINERY AT NEW ORLEANS.

formerly handled exclusively in sailing vessels, is now handled exclusively by steamers. The discharging of the cargoes of bananas, with the exception of the port of New Orleans, is done entirely by hand and the best record in this work is the discharging of about 48,000 bunches of bananas in ten hours time. The discharge of this number of bunches required the employment of about 250 men. At the port of New Orleans there is in operation a machine for the discharging of bananas which works on the endless chain principle, but owing to the extreme rise and fall of tides at northern ports it has not been found practical to employ this machine in the north.

CONCERNING LAUNCH OF BATTLESHIP NEBRASKA

It was stated in the newspapers that the battleship Nebraska, recently launched at the yard of Moran Bros. Co., broke away from her fastenings some few minutes prior to the time set for the launching, and even a few technical papers, including the Marine Review, fell into the error. The exact circumstances are related in the following communication from Naval Constructor Ruhm, government inspector at



HOW BANANAS ARE LOADED ON UNITED FRUIT CO.'S STEAMERS IN JAMAICA.

Moran Bros. Co.'s yard at Seattle, Wash., and in strict justice to the company they are published:

"This statement would appear to give a wrong impression concerning what was one of the most successful launchings that I have ever seen. There was no trigger of any kind used in the launching of the Nebraska; the ship being released by sawing through timbers at the forward ends of the sliding ways. While it is true that the time set for this launching was 2:13 o'clock the anticipated time of high water, everything was ready some minutes before this; there was ample water over the ends of the ways, and in order to avoid holding the ship any longer than absolutely necessary and any possible settling on the ways she was let go at 1:59 o'clock. There was not the slightest trouble of any sort; every detail of the launching being, as far as I could ascertain, most satisfactory. I address this communication with the idea, if possible, of correcting this erroneous impression which is in some way being circulated and which might otherwise in the future be recorded in connection with the history of this ship, which all hands of course hope will be a most satisfactory history."

STEAMBOAT INSPECTION SERVICE

Editor Marine Review: I want to thank you for the article contained in your issue of Oct. 20 on the subject of the removal of the supervising inspector of second district, Mr. R. S. Rodie. Your suggestions were good and to the point. Let the public know what those recommendations were and possibly find out why Mr. Cortelyou did not have them adopted, and put them in force, some of which would have made the

Slocum disaster impossible, one namely, of leading steam pipes into the lamp lockers, oil rooms and like compartments on steamboats.

Did Mr. Cortelyou's resignation from the department clear him from the responsibility of blame? Had they been guilty would it have cleared Dumont, Barrett, or Rodie to have resigned their commissions a few days after the Slocum burned? The Press has shown a disposition to find the one that is guilty of contributory negligence. Does the president think that the public is satisfied now since he has made a scapegoat of the three officials removed, men who administered the laws as they are in the rules and regulations today (which are a botch I admit), one of whom was a member of the Board of Supervising Inspectors. Let us have the report of the board and the reason why Mr. Cortelyou did not approve of the rules recommended by them.

Would it not be good judgment for the president in naming the commission to revise and investigate the service to have put at least one master or pilot and one engineer on it instead of retired naval officers.

ULSTER DAVIS, President Albany Towing Co.

Albany, N. Y.,

The department of marine has decided to make an experiment during the first week in December with the ice breaking steamer Champlain to keep a channel open for navigation between Quebec and Montreal. A loaded collier will be met about 25 miles below Quebec by the Champlain and will be taken into Montreal, and after discharging her cargo will be escorted to open water again.



DEVOTED TO EVERYTHING AND EVERY INTEREST CONNECTED
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ON THE FACE OF THE EARTH.

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DEC. 1, 1904.

Congress will convene on Monday next and notwithstanding reports to the contrary the Merchant Marine Commission will have its report ready to submit to it, accompanied by a bill which will embody the result of its late inquiry among the industrial interests of the United States. This measure, as indicated elsewhere in our Washington correspondence, will advocate a restoration of tonnage dues to be imposed alike on all vessels. However, as American vessels visiting these shores are only 10 per cent of the total number it follows that foreign vessels will pay 90 per cent of the tonnage dues. The plan is to create a special fund out of these dues and expend it among American vessels in proportion to services rendered. From the point of view of the man in the street no objection can be raised to this because it is not taking money away from the tax payer. The tax payer does not contribute a penny of it. It is known that the commission were somewhat favorably impressed in the early days of its inquiry with the pleas for the restoration of discriminating duties, but as discriminating duties would aid only the import trade it was felt that it was only a half measure and one open to serious retaliation on the part of other nations. Moreover legislative complications presented themselves in the form of treaties with other nations which would have to be abrogated. With the imposition of tonnage dues, however, no serious objection could be raised, nor could retaliatory

measures be employed because the tonnage dues now exacted upon American shipping by other nations are quite high, and it would be impossible for other nations to add to the dues which American vessels now have to pay without adding to the dues of the vessels of all nations. The measure seems to present a logical way out of the difficulty. The decline of American shipping in the foreign trade has been quite clear but the remedy for it has not been so clear. This new measure seems to afford a national remedy and to be the best yet presented.

The movement started at the Union Club, Cleveland, last week which resulted in the formation of the Merchant Marine League of the United States is really one of the most spontaneous movements of a national character that has been started in this country in a long while and it is to be attributed solely to the great interest which pervades all classes as to the merchant marine service. The formation of the league is the direct outcome of the series of meetings held in the great lakes region by the Merchant Marine Commission which was appointed by the last congress to inquire into the state of American shipping in the foreign trade. It assumed tangible form, however, at a dinner given at the Union Club to Mr. Aaron Vanderbilt of New York by a number of Cleveland gentlemen.

Mr. Vanderbilt has been most unselfishly devoted to the interests of the merchant marine over a long series of years and has never permitted his interest to flag no matter how discouraging conditions became. That they are most discouraging is borne out by the fact that the registered tonnage employed in the foreign trade of the United States is 100,000 tons less than it was almost a century ago, whereas the volume of trade to be carried over sea has multiplied twentyfold since then. As soon as Mr. Vanderbilt had concluded his emphatic address fully a score of speakers followed and the tenor of all the remarks was that an organized effort should be made to restore the American ship to its former prestige upon the high seas. This could only be done through a definite organization and a definite organization was accordingly formed with the following as temporary officers: Harvey D. Goulder of Cleveland, president; Mr. Aaron Vanderbilt of New York, vice president; Col. J. J. Sullivan of Cleveland, treasurer, and Mr. John A. Penton of Cleveland, secretary.

Mr. Harvey D. Goulder is the general counsel for the Lake Carriers' Association and is popularly credited with being the foremost admiralty lawyer in the United States. He has had ripe experience in studying the question of navigation in all its bearings and is a most competent man for the presidency of this league. Mr. Aaron Vanderbilt is not now active in any shipping enterprise though he was for fourteen years the manager of the Ward Line of New York. He is the chairman of the maritime committee of the Board of Trade

and Transportation of New York which has done so much to develop a general interest in shipping, but his active business connections are with the Wheeler Condenser & Engineering Co. of New York of which he is vice president. Col. J. J. Sullivan is the president of the Central National Bank of Cleveland and of the First National Bank of Canton. He is also president of the National Board of Trade, a body which has done much to solidify the business interests of the country, and he has all his life been engaged in enterprises of a public character. Mr. John A. Penton is the publisher of the Marine Review and has had a long training with the manufacturing interests throughout the country, chiefly as organizer of the National Founders' Association.

While this league is scarcely yet a week old numerous applications have been received for membership in it and it will undoubtedly become a body of great influence. It is significant that those at the dinner given to Mr. Vanderbilt were neither shippers nor ship builders, but merchants, bankers and manufacturers, which shows how deep, how sound and how really patriotic is the interest in the merchant marine service of the United States. The league is convinced that something must be done to upbuild the merchant marine in the foreign trade, else it will perish altogether.

CLOSE OF NAVIGATION

All the vessels of the Steel Corporation now at Lake Erie ports, will have cleared for the head of the lakes by Thursday evening of this week, and will probably receive their last ore cargo of the season on Monday next. The weather report from the head of the lakes shows that the temperature at the shipping docks is below zero and that the ore cannot be loaded from ore pockets without great trouble. The last vessels of the corporation will, however, be loaded directly from cars and from the time that the ore leaves the mine until it is aboard ship will be a matter of only five or six hours. By this means the difficulty of freezing will be reduced to the minimum. The vessels of the Steel Corporation will, however, carry coal as long as there is any coal to be had until the actual prohibition of navigation by the formation of ice. Very little coal has been coming to Lake Erie docks during the past six weeks and the corporation is short of its usual supply at the mines which is the reason for its determination to force it through until the very last minute.

Ore figures for November have not yet been compiled but it is known that a considerable quantity of ore was shipped and that the total shipments for the year will not be far from 21,000,000 tons. Probably with all-rail shipments added the total will be over 21,000,000 tons. Considering the fact that the season was six weeks late in beginning this year, the shipments of ore have really been phenomenal and shows with what ease the existing fleet of vessels can handle a commerce that fluctuates between such wide latitudes. The ore shipments of September and October have been the heaviest of any fall months, exceeding in each case 4,000,000 tons, and have been handled with the utmost ease. This capacity of the existing fleet leads to some sober reflection as to what is to be done with the smaller class of vessels when it is considered that twenty ships of an average carrying capacity of almost 10,000 tons per trip are to be added to the active fleet next season. The average rate paid for the carriage of ore this year has been 70 cents as against 84 cents for the preceding year, and while it is admitted that the larger class of carriers have

made some money still their net earnings over fixed charges upon bonds have been so modest as to leave great doubt as to whether the smaller class of carriers have been so fortunate as to break even. There is little relative difference between the cost of operating a small vessel and a large vessel, that is to say the proportionate cost of operation of the large carrier over the small carrier bears no relation whatever to the added earning power of the large carrier. Next year this disparity will be emphasized by the advent of the twenty ships referred to. The hope of the small carrier from present indications lies in the fact that a great volume of business will probably be moved next year and that there will be work for all of them to do. However, it is clear that the day of the small carrier on the great lakes, meaning by that even the 4,000-ton ship, is past as far as the ore trade is concerned.

AMERICAN SHIP BUILDING CO.'S AFFAIRS

There has been of late some flurry of outside influences in the stock of the American Ship Building Co., and it has brought into being all sorts of reports regarding the future of the property.

The first was that it was to be sold to the United States Ship Building Co., a combination of coast ship yards, but really the American Ship Building Co. is in a better position to buy the United States Ship Building Co. than the United States Ship Building Co. is to buy it. The latest and most foolish rumor is that the United States Steel Corporation is to buy the American Ship Building Co. on the ground that it has decided to completely modernize its fleet on the great lakes and wants a ship yard in which to do it.

The Steel Corporation undoubtedly finds it profitable to operate a great fleet of vessels on the lakes considering the fact that it is the largest shipper on the lakes, bringing down annually from 12,000,000 to 16,000,000 tons of ore. But the building of ships and the operation of them are two different things. It would not be economy for the Steel Corporation to acquire the plants of the American Ship Building Co. for the purpose of building its own ships. On the contrary it would be the height of extravagance. The American Ship Building Co. has seven modern ship yards but like all ship yards makes its greatest profit out of the repair of ships and not out of the building of them. The Steel Corporation would have to go into the ship repairing business generally if it wanted to make money out of the plants of the American Ship Building Co. Such a departure would be absolutely foreign to its business which is the making of steel in various forms. The Steel Corporation can buy its ships cheaper from the American Ship Building Co. than it can build them itself. In the first place it furnishes its own plates and pays a profit solely on the labor of putting the ship together. It might as well be set down that the American Ship Building Co. is not for sale. It is largely owned by young men and is absolutely managed by young men who, if they sold, would not know where to put their time or capital to better advantage. The ship building company is thoroughly established; it has a surplus of nearly \$4,000,000 in the treasury and orders on its books and in sight that will keep it busy for several years to come. Of all the combinations organized in the United States during the past five years there is none so conservatively organized as the American Ship Building Co. and none so well entrenched financially.

The Monongahela River Consolidated Coal & Coke Co. of Pittsburg, Pa., expects to install coal bunker machines for supplying steamships with fuel at the port of New Orleans. Details concerning the equipment are not as yet obtainable.

Rear-Admiral Robley D. Evans, now president of the light-house board, will be appointed to the command of the north Atlantic squadron when Rear-Admiral Barker retires next March.

FORECAST OF SHIPPING BILL

Washington, D. C., Nov. 30.—A shipping bill will unquestionably be passed at the coming short and last session of the fifty-eighth congress. The prospect has never before been so bright, nor has the country ever before been so unanimous and insistent for this legislation. The Merchant Marine Commission, which is composed of five senators and five representatives, is holding daily sessions at the capitol, getting its report into shape, and perfecting the details of the bill that will accompany its recommendations. Despite statements to the contrary that have emanated from sources unknown to the commission and evidently hostile to American shipping, the report will be ready for presentation to congress, and the bill it is expected will be perfected in all of its details and in readiness for introduction in congress, on Monday next, the opening day of the session. Just who will introduce the bill in each branch of congress has not yet been determined but it is likely to be Senator Gallinger who will introduce it in the senate and Gen. Grosvenor, the chairman of the merchant marine and fisheries committee of the house, who is a member of the commission, who will introduce it in the house.

The bill itself promises to be one of the most simple and effective ever presented to congress. It seems to be the plan, from the information obtainable here, to levy a substantially larger tonnage tax on all vessels entering the ports of the United States from foreign countries—American and foreign vessels alike—than is now levied, and to segregate the fund thus collected and use it as a fund with which to encourage the building and operation of American vessels in the foreign trade. During the course of its public hearings the commission has had such a plan presented to it from different people, and it has been suggested that the amount of the tax be made 50 cents per ton for each entry of a vessel into the United States. Such a tax, based upon the tonnage that entered our ports from foreign countries last year, would yield some \$13,000,000 or \$14,000,000, about 10 per cent of which would be contributed by American, and 90 per cent by foreign shipping. Perhaps such a tax may seem to be too high, and there are those who suggest that 20 cents per ton for each entry would suffice, but this is questioned quite seriously by those most expert. Again, whether the tax shall be levied upon the gross or the net tonnage of the vessels is important, and this is a point apparently not yet settled. If the tax is collected on the gross, the steamships, and especially the transatlantic greyhounds, will bear the heaviest part of it, while if it is levied upon the net they will be very greatly favored as compared with cargo steamships, and especially when compared with sailing vessels. Again, it has not been decided just how the fund thus created will be distributed, but if the collection is made upon the net it will be doubtless distributed on that basis, since to do otherwise would be to doubly discriminate against the sailing vessel and the large cargo steamship, and it is the purpose of every member of the commission to make the promotion of the cargo carriers, both steam and sail, the paramount feature of the bill.

As to mail steamships, running on regular lines, provision will no doubt be made for increasing their number both in respect to lines and to steamers, but this can and probably will be accomplished through some very slight but effective changes in the existing ocean mail service act, which has been in operation for nearly fourteen years, and which act has been the mainstay of our foreign-going steam shipping.

Too great emphasis cannot be laid upon the fact that, in deference to the demands of the people in all parts of the country who have appeared before the commission, the freight carrier, the vessel that will increase our commerce, that will make new markets for our increasing exports, will receive by far the larger part of the commission's attention. Precisely as the fast steamship was provided for in the legisla-

tion enacted in 1891, so now the legislation enacted will apply far more generally and effectively to the cargo carrier than to the mail carrier. It should be said, however, that payments for mail transportation will be made from the funds collected by the government for sea postage, not one-half of which is now paid out by our government for ocean mail carrying. Thus, the mail steamships will not participate in the fund collected from the increased tonnage tax, nor will the cargo carriers, as such, enjoy any part of the sea postage fund.

The demand in all parts of the country for a return to the old policy of discriminating duties has caused the commission to devote to that method a great deal of very painstaking care, but after the matter had been thoroughly threshed out in all of its many details, it appears—although official confirmation of the fact is unobtainable—that that method will be discarded. The suggestion of placing a tax upon non-dutiable imports met with unanimous opposition in the commission, and it was discovered that any plan of discriminating duties that left the free list as it is, would fatally handicap the measure that could be drawn to put discriminating duties into effect. This, together with the very strong reluctance of the administration—in fact, of any administration—to contemplate the abrogation and revision of some fifteen or twenty treaties and conventions with as many other nations, which would be necessary before the discriminating duty policy could be applied, seems to have sounded the knell of that plan.

It should be said that the Democratic members of the commission seemed to look with particular favor upon the discriminating duty policy, but they have themselves seen that it is an impracticable remedy at this time. This recalls the fact that, in 1890, Gen. Joseph Wheeler, then a member of the house merchant marine and fisheries committee, suggested that "we should modify our laws and treaties so as to lessen duties upon merchandise imported in American ships," regarding which suggestion the then commissioner of navigation, Capt. W. W. Bates, said, in his annual report of 1890, the following in part:

"This was the old way of ship protection. It will no doubt be again revived. In a few years we shall most likely see the French return to differential duties. Meanwhile they have prepared their marine for the change by increasing its steam efficiency. We must do likewise. Our marine is not now in condition to serve the country to advantage as it will be ten years hence if due protection be given. Then the payment of bounties may cease and differential duties take their place. * * * The way to begin this work is by a bounty system. A system that will act immediately and efficaciously. A system that will especially increase our exports as differential duties cannot do and never did do. Differential duties will give us the import trade, but not necessarily the export trade to the same extent. Bounties will give us ultimately the control of both trades. For the present all in favor of an American marine must vote for bounties."

What was then said is as true now as it was then, as is being very clearly realized, even by the Democratic friends of the discriminating duty policy.

One thing that the work of the commission has accomplished has been the final laying of the ghost of free ships that, although for many years very dead, has, nevertheless, been stalking around, as a possible remedy for our depressed shipping. The commission has written to every American owner of a foreign vessel asking him whether he would, if he could, place her under American registry, and run her in the foreign trade of the United States, without government aid. To this question every reply that has been received has been in the negative. Not one American owner of a foreign vessel can be found who would take advantage of a free ship law, pure and simple. When we consider that 3 tons

of foreign vessels are owned by American citizens for every ton of American vessels so owned in the foreign trade, it must be apparent that there is no demand for free ships anywhere in the United States, except among a handful of fanatical free traders, with whom theories have always been regarded as paramount to facts.

The most important of all of the many important points in connection with the closing work of the commission is the unbiased manner in which every member approaches the consideration of the details of the several plans. This augurs most promisingly for a unanimous report. If that be accomplished, if both the Republicans and the Democrats unite upon one report, and if they all agree upon the details of the bill to be offered with which to carry into effect their recommendations, then the early passage of the measure may be considered as a certainty. Everything now points to such a happy consummation of the arduous labors of the commission. With such a result accomplished it is likely that the bill would be reported from the senate and house committees before the holidays, and passed in both branches early in January. While to many who have for a generation been advocating protection for American shipping in the foreign trade such an effective and prompt solution of the problem may seem too much to hope for, nevertheless such is the opinion that is shared by a majority of the members of the commission, and which they are conscientiously laboring to make unanimous.

There are indications that at the coming session of congress a bill abolishing the collection of compulsory pilotage by state pilots from American vessels engaging in the coastwise trade—a system of indefensible taxation that obtains nowhere but in a few southern states, and then only against American sail vessels—will be passed, leading senators and representatives heartily agreeing that the collection of this tax has continued far too long.

MASTER MARINER.

MERCHANT MARINE COMMISSION

The Merchant Marine Commission has just concluded its southern tour and has held meetings in Washington to give those who had no opportunity to appear before it at other hearings to make their views known. The tour of the commission of the southern states was most satisfactory in every way and information of much value was obtained. The New Orleans meeting was held under the auspices of the Board of Trade and the attendance was very large. A number of organizations, including the New Orleans Progressive Union, the Bar Pilots' Association and the Sailors' Union appeared before the commission. The speakers addressing the meeting were in the order named as follows: Fred Muller, secretary of the Board of Trade; Capt. T. J. Woodward, representing the Board of Trade reception committee; Pearl Wight, representing the exporting interests of New Orleans; James W. Porch, speaking for the Board of Trade and the proposed new steamship line; C. H. Ellis, of the United Fruit Co.; W. P. Ross, representing the steamship agents; Joseph Kohn, representing the city merchants; John B. Lindhe, representing the American Association of Masters & Pilots; John A. Younger of the Marine Firemen's Beneficial Association; George Hawthorne, secretary of the Seamen's Union; Capt. John Redmond, for the Bar Pilots introducing Judge J. R. Beckwith and John E. Flynn, deputy United States commissioner.

The addresses treated for the most part of the condition of American shipping out of New Orleans, the causes which have produced the result and the possible steps which might have an alleviating influence on the situation. It was agreed that American shipping had been driven from New Orleans as from all other gulf ports. Attention will be paid to all these addresses later, but in the present issue only that of Mr. C.

H. Ellis of the United Fruit Co. can be given. It was as follows:

"Our company are the charterers and owners of a very large fleet of vessels, consisting of vessels under the Norwegian flag, the Swedish, German, English and American. Our company was organized in the year 1899, and at that time we had quite a few American steamers in our employ most of which we owned outright, but the cost of operating them as compared to foreign vessels was so much more that we have in a measure been compelled to abandon them altogether and use instead vessels of the Norwegian, Swedish and German flags. The Norwegian vessel is by far the most economical to operate, and next comes the Swedish, then the German, then the English. The difference in the cost of operating the American and Norwegian vessels consist principally of the wages paid to the crew, the food scale and the number of men required to operate a Norwegian vessel of the same size as an American ship; our experience has shown us that we can operate a Norwegian vessel for about 30 per cent less than we can an American vessel, which is an item of considerable importance in our business. In regard to the ways and means as to bring about a revival of our merchant marine, and enable us to handle American steamers at or near the cost of foreign vessels, is something which requires very careful consideration, and may vary with the demands of local conditions at the various ports; my opinion, as far as the port of New Orleans is concerned, would be to at first allow the owners or charterers of all foreign vessels, who are American citizens, to transfer these vessels to the American flag, giving them five years time in which to do so; this permission, however, not to cover any future charters or purchases made after the present time. In addition to this it would be necessary in my opinion to only man these vessels with American citizens, in so far as the officers are concerned, allowing the ship owners to engage the sailors and firemen and such other part of the crew, who are not officers, to be composed of any nationality. I make this statement for the reason that I do not consider that we have sufficient seamen to man vessels; furthermore, they require better wages and would demand more pay if American ships were confined strictly to the employment of American citizens.

"The local unions of the port are a great drawback to our shipping interest and we have been compelled to even divert some of our English vessels to eastern ports on account of the high wages demanded here by the various unions. I would not favor the taxation of foreign bottoms for the benefit of American vessels, as it would in my opinion be detrimental to our foreign commerce, but in order to off-set the difference in the cost of operating an American ship and a foreign vessel, after we have been allowed to engage the majority of the crew, consisting of any nationality, I think it should then be determined what amount of subsidy it would then be necessary to in a measure off-set this, and the remedy applied.

"In regard to the building of American vessels, I see no reason why our American ship yards cannot compete with any foreign ship yard, provided they have the volume of business to handle. I am in a position to say that the American built ships are superior in construction to any ships in the world excepting possibly the English built vessels, and the modern American ship is, in my opinion, of a better finish than even the English vessel. I wish to add before closing, that all American steamers now receive a larger compensation from the government for carrying mails than foreign steamers, and in many instances they enjoy mail contracts which of course is an advantage to be gained by operating them."

At the conclusion of the New Orleans hearing the commission went to Pensacola where a meeting was held under the auspices of the Chamber of Commerce. They were received by President Avery of the Chamber of Commerce who delivered the address of welcome. Those appearing before

the commission were K. M. Roberts, A. F. Warren, John A. Stillman, John Christie, J. Ed. O'Brien, Bryan Dunwoody, F. O. Howe and F. F. Bingham. After the hearing they were asked to the Pensacola navy yard as the guests of Capt. Perry, commandant of the yard. In the evening the commission left for Brunswick, Ga.

The hearings in Brunswick were held in the city hall where they were welcomed by Capt. C. P. Goodyear, chairman of the Board of Trade committee. Capt. Goodyear made an eloquent plea in behalf of aid for the American ship and also presented a paper by Capt. W. M. Tupper, who has been a sea captain and who is now representing two large steamship lines plying to Brunswick. Capt. Tupper represented that when he was the master of a sailing vessel sailing to Cuban ports fully 90 per cent of the vessels engaged in the sugar trade with that island were under the American flag but that now every one of them had been driven out of the trade by foreign competition. He especially called attention to the Munson Line doing business between New York, gulf ports and the West Indies, which comprises the largest fleet of vessels and operates them entirely under foreign flags because it can do so more cheaply.

Capt. W. E. Kay, an attorney who has given much attention to shipping, stated that in the early days of the republic discriminating duties had built up the American merchant marine and that he felt there was no hope for the revival of American shipping unless some legislative aid was extended.

Others speaking were Mr. W. B. Stillwell, Savannah, Ga.; Capt. Swan of Fernandina, Fla., and W. S. Tison, Savannah.

The concluding hearing of the southern tour was held at Newport News, Va. The Newport News hearing was under the auspices of the Chamber of Commerce and was called to order by President Powell of that body. State Senator Saxton W. Holt was the first speaker. He was followed by Capt. McCerick, Norfolk, who as the representative of the Norfolk Board of Trade presented a lengthy paper in which he advocated liberal postal allowance and differential duties in favor of American ships.

Mr. H. E. Parker, superintendent of terminals for the Chesapeake & Ohio railway urged that this country should follow the example of England and subsidize its steamship companies with mail contracts until they become self-supporting.

Mr. W. A. Post, superintendent of the Newport News Ship Building & Dry Dock Co., made a statement which was of particular interest to the commission. After touching upon the deplorable state of American shipping at present he said that 7,800 men were now on the pay roll of his company and that the weekly pay roll amounted to from \$65,000 to \$85,000. Senator Martin asked if favorable legislation should be enacted at the end of twelve months how many ships could be turned out at Newport News annually. Mr. Post replied that the yards could turn out ten ships of 7,000 tons capacity each. He added that the yard should really employ 10,000 men as there is room for that many. Mr. Post stated that the ship yards of the country could turn out from sixty to seventy vessels a year.

Mr. John Golden, superintendent of the Sailors' Rest, appeared as the representative of the seamen. Capt. Boatwell of Norfolk, Pa., read an excellent paper on the merchant marine advocating a direct subsidy. Mr. R. G. Bickford submitted a copy of a paper clearly pointing out why American shipping should receive legislative aid.

Mr. C. W. Robinson, representing the Central Labor Union, read a paper in which he urged that the scale of wages should not be cut in any legislation which might be made. Mark German and J. J. Thompson, two masters, spoke on the subject as it is viewed by the seafaring man. Mr. W. G. Melvin, local agent for the Seaboard Transportation Co.; Mr. W. S.

Upshur, agent for the Chesapeake & Ohio Grain Elevator Co., and Mr. R. M. Lett, made interesting talks.

When the commission returned to Washington the navy and post office department officials were invited to appear before it, the former to submit their opinion of desirability of the merchant marine as an auxiliary to the navy and the latter to speak of the benefits to accrue to the postal service as a result of an improved merchant marine.

The navy department was represented by Secretary Morton, Capt. Usher, Capt. Alfred T. Mahan (retired), Rear-Admiral Stephen B. Luce (retired), and Rear-Admiral P. F. Harrington, commandant of the navy yard at Norfolk. Representing the post office department was W. S. Shallenberger, second assistant postmaster-general, Secretary Metcalf of the department of commerce and labor also was invited to attend the hearing.

CRUISER PENNSYLVANIA VERY FAST

The armored cruiser Pennsylvania in her official trial trip off the New England coast made the highest speed with the smallest relative expenditure of fuel of any armored vessel so far built for the United States navy. Her contract called for 22 knots and her average speed for the four hours' trial was 22.43 knots per hour, while her coal consumption was 2.2 lbs. per horse power per hour.

Her builders, William Cramp & Son of Philadelphia, made no attempt throughout the trial to push this, their greatest vessel, but on the other hand bent their energies to exceed the government requirement at the most economical expenditure of fuel possible. Her trial was, therefore, the first of the numerous tests over the Cape Ann course where speed was not the first object sought for.

The day was perfect for the trial, a moderate breeze at the start falling to a flat calm at the finish, while the sea throughout was very smooth. Although the Pennsylvania started slowly, being nearly a quarter of a knot below her requirement over the first two legs of the course, she gathered headway as she went on and, over one leg of five miles of the forty-four to the turn, averaged 22.53 knots an hour.

After making a remarkable quick turn at the upper end of the course, she started back and only once in the seven legs to the finish did the speed fall below 22½ knots, while at one time, for 6.6 knots, it was 23.2. There was considerable interest in comparing her effort with that of her consort, the Colorado, which preceded her from the Cramps' yard only a month before. While the latter made a 6.6 knot spurt at a rate of 23.294 per hour, her average for the entire course of 88 miles was 22.26 knots, compared with the Pennsylvania's 22.43 knots per hour.

The economy in fuel consumption, according to Edwin S. Cramp, was due to the rigid discipline in the fireroom and the excellence of the boilers. The firemen distributed the coal regularly and evenly, with the result that the boilers steamed freely. At no time was there an attempt made to race the boat, although Mr. Cramp stated at the end of the trip that he was confident that the Pennsylvania could have made an average of 23 knots. The engines developed a horse power of over 28,000, while the propellers averaged 128 revolutions per minute.

CHICAGO GRAIN REPORT

Chicago, Nov. 30.—From last report chartering has been steady on the basis of 1¾ cents corn to Buffalo and Georgian Bay points and to Ogdensburg and common points at 2½ cents oats and 2¾ cents corn.

Receipts of grain from country points are fairly up to expectations but account of fresh quality of grain there is some difficulty in assembling round cargo lots, and as will be noted

rail engagements of the past week are about triple the quantity moved via lake.

While arrangement of cargo insurance companies look to the permission of lake shipping for the few days following Dec. 5, the extent of the ensuing lake movement is problematical and must necessarily be determined on the ability of shippers to meet the freights commensurate with the risks and expenses attendant upon this late season handling.

Shipments of the week were thus distributed: All rail lines 195,000 bu. wheat, 600,000 bu. corn, 503,000 bu. oats, 104,000 bu. barley; by lake to Buffalo and other American ports 200,000 bu. wheat, 280,000 bu. corn, 50,000 bu. oats, 180,000 bu. barley; by lake to Canada ports 25,000 bu. corn.

Lake and Rail Shipments:

	This week.	Last week.	Same week last year.
Wheat	395,093	917,014	540,679
Corn	913,231	581,522	1,184,362
Oats	552,990	1,049,057	840,579
	1,861,314	2,547,593	2,565,620
	Shipments since Jan. 1, 1904.		Same time last year.
Wheat	16,189,237		21,986,657
Corn	66,386,205		86,976,682
Oats	42,353,843		59,938,577
	124,929,285		168,901,916

Stocks of Grain in Elevators:

	This week.	Last week.	Same week last year.
Wheat	3,930,000	3,903,000	5,796,000
Corn	1,623,000	750,000	3,116,000
Oats	9,055,000	8,855,000	3,125,000
Rye	429,000	434,000	373,000
	15,037,000	13,942,000	12,410,000

AT THE HEAD OF THE LAKES

Duluth, Nov. 30.—Several million bushels of flaxseed have been contracted for fall shipments to Buffalo and winter storage there aboard ship. The base of most of this chartering has been $2\frac{3}{4}$ to 3 cents, though a few cargoes have been taken at $2\frac{1}{2}$ cents. Aside from what may have been done by the American Linseed Co. there have been some 2,500,000 bu. of this stuff, and it is expected that at least 4,000,000 bu. flax will go out from here before the close of the season. There are now 7,000,000 bu. here and it is coming at the rate of 1,250,000 bu. weekly, a rate that may prevail for a long time yet, as there are intimations of large forwardings from the country. In spite of this large stock and the immense weekly receipts there is a premium of 2 cents a bushel for cash over December or to arrive seed.

The Great Lakes & St. Lawrence Transportation Co. of this city, has made a difference in receipts at Montreal this year of about 375,000 bbls. of flour and 2,000,000 bu. wheat, much of which would have gone via Buffalo but for the removal of canal tolls. With a lively export trade this would be a great route, but the export of American grain and grain products is a declining business. Exporters at the head of the lake have not received an order for American grain for so long that they would scarcely know what to do with one, should it come. Their business is now with the Canadian ports, or with estimates on imports of wheat into the United States. All estimates of imports, however, for this crop must be revised, for there is so much more wheat in the American northwest than was figured on by the crop experts that it is swamping their computations. Grain is coming into terminal and country elevators in the northwest in a way that is astonishing the authorities who figured on a small crop. On the Great Northern

road alone, in its division west from Larimore, there are now 4,000,000 bu. in country elevators.

LUMBER TRADE

Duluth, Nov. 20.—Lumber shipments for the year are about over. They have been about as heavy as during the preceding season, in spite of the diminution of supplies for the eastern trade from mills located on deep water at the head of the lakes. This decrease has been taken up by mills in the interior, and promises to be again met the coming year, though there will be a further curtailment of sawing activity in Duluth. The great increase in shipping this way for the cargo trade has been by mills at and near Cloquet, where the Brooks-Scanlon and Weyerhaeuser companies are finding that the eastern trade is better for certain grades of their stock than the western and southern. It is probable that these mills have shipped through Duluth and east this year not very much under 100,000,000 ft. of sawn lumber, or about 125 average cargoes. The new mill of the Virginia Lumber Co., on the Mesabi range, is also a large increase for this trade, for all of its product of about 75,000,000 ft. a year is going out that way, via this city. Two of the mills at Tower and Ely have been large shippers for a long time, but the third in that district, that of the St. Croix Lumber Co., has always sent its product into the southwest, by rail. Next year it is understood that this company will be in line for eastern trade and will ship largely of its cut via this city and Two Harbors. The Duluth & Iron Range road is contemplating an increase in dock room at Two Harbors to care for the company's shipment.

Large amounts of lumber have been sold by mills here and in this vicinity for eastern shipment during 1905, and this amount is growing with additional sales. Including the sales of Ely, Scanlon and Cloquet mills going east, it is estimated that not less than 20 per cent of low grade lumber to be made next year by these mills is already sold for the east, and that a considerable part, though less proportionately, of higher grades is also sold for the same destination.

IRON MINES CLOSING

Duluth, Nov. 30.—Most of the ore mines have ceased work for the year. This includes all but a few that are behind with their schedules, and these latter will be over in a week or ten days. It will take all the present week to clean up docks and prepare for the winter. There has been no need of steaming ore in cars or docks all fall, a material saving to railway companies. The biggest shipper of the year is doubtless Stevenson mine, of Corrigan, McKinney & Co., which has made a record of about 1,630,000 tons. Big mines like Fayal, Mahoning, Biwabik, Chapin and Norrie, have fallen off materially, Fayal to under 1,000,000 tons and Chapin to about 545,000. Burt, a new mine of the Steel Corporation on the Mesabi, closes the year with a record of 1,300,000 tons, and Mountain Iron has produced 1,000,000 tons. The Ishpeming and Negaunee mines show a decline. Stock piles are small throughout the region and there must be steady and heavy operation all winter to prepare for the expected business of 1906. Very few, conversant with the trade, look for anything like the 30,000,000 tons shipment in 1906 that is talked by some. Indeed it is supposed that from 25,000,000 to 26,000,000 is about where the year will land.

The Canadian Turbine Propulsion Power & Light Co. has been incorporated under the laws of Quebec province, with a capital of \$500,000 and offices in Montreal, to acquire the patent rights of, and to manufacture turbines or other machinery for vessels, etc. W. Rowbotham, engineer; H. Levettus, importer, of Toronto; M. Auerbach, financial agent; N. P. Bryant, broker, and H. H. Hull, accountant, of Montreal, are the promoters.

LAUNCH OF BATTLESHIP NEW JERSEY

The launch of the battleship New Jersey at the yard of the Fore River Ship Building Co., Quincy, Mass., on Nov. 10, was successful in every particular. Mrs. W. B. McKinney, daughter of Governor Murphy of Virginia, acted as sponsor for the battleship and with excellent self-possession broke the bottle of champagne on the vessel's bow just as it started down the ways. On the governor's staff were Adjutant General R. H. Breintnall and Mrs. Breintnall; Col. Charles W. Parker of Jersey City; Capt. Lewis F. Bryant of Atlantic City and Lieut. Everett Colby of West Orange. Others attending were United States Senator John Kean, Congressman W. H. Weiler and H. C. Loudenslager of the naval committee, Seaman R. Wayne Parker and former Congressman George Hires. Governor Bates and Lieut. Governor Guild represented Massachusetts. The New Jersey is the first war ship to be launched at the Fore River yard since President Francis T. Bowles, formerly chief constructor of the navy, took charge of the yard.

The New Jersey is one of five seagoing coast line battleships, carrying the heaviest armor and the most powerful armament ever put on vessels of that class, which were provided for by congress in 1899 and 1900. Her general dimensions are: Length on load water line, 435 ft.; extreme breadth at load water line, 76 ft. 2½ in.; trial displacement about 14,948 tons; main draught at trial displacement, about 23 ft. 9 in.; greatest draught, full load, about 26 ft. When she has her full complement the New Jersey will carry, in addition to her commanding officer, nineteen ward room officers, ten junior officers, eight warrant officers and 772 crew including sixty marines. There are also accommodations for

a flag officer and chief of staff, making a total of 812 men of all grades.

The New Jersey class of battleship differs from any other in the American navy in some important respects. Next to the Connecticut and her two sister ships, which are a later development, and are almost experimental in some regards, it is the heaviest this government has ever had. The many widely different qualities essential to a perfect fighting machine, which are difficult of adjustment in a 15,000-ton vessel, have been balanced in accordance with the experience of other craft of the new navy. Modifications in the original plans have even been made as the work of construction went on. For example, the accident to the battleship Maine a couple of years ago showed the desirability of adding strength to resist the shock from the discharge of the heaviest

modern ordnance and the supports of the New Jersey's gun positions were made heavier throughout.

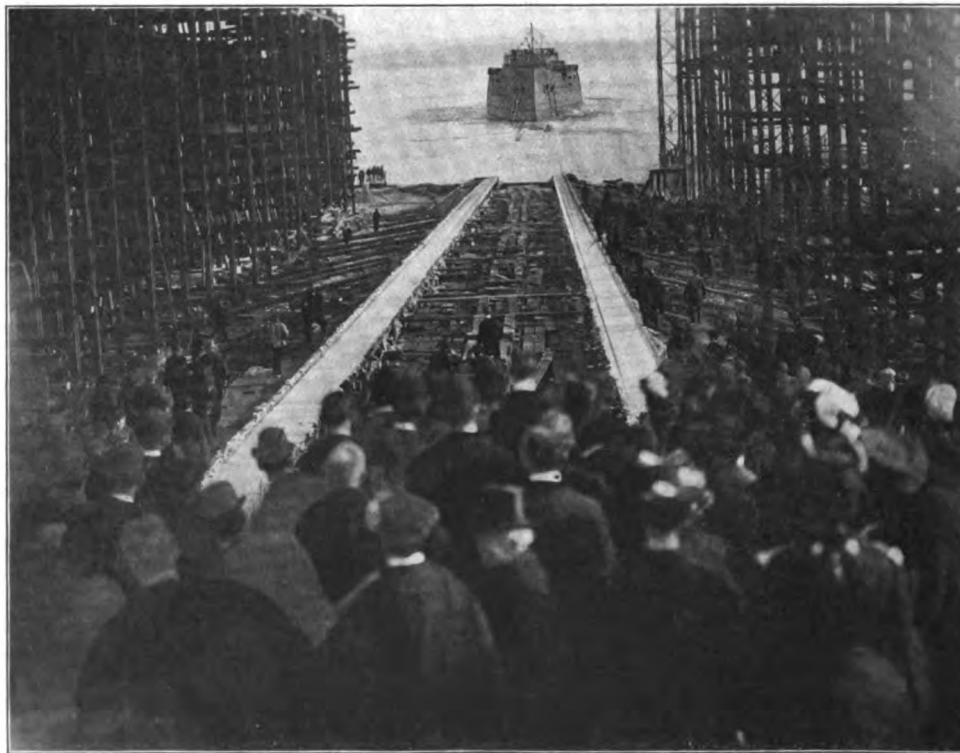
Perhaps the most striking thing about this enormous floating fortress is that it will have a speed of at least 19 knots, which compares most favorably with any battleship under construction abroad as well as with any as yet projected. To achieve this the New Jersey has twin screws driven by two four-cylinder, triple-expansion engines of something like 19,000 I. H. P. and making 120 revolutions a minute at maximum speed.

Steam will be supplied at a pressure of 250 lbs. to the square inch from twelve water tube boilers placed in pairs in six independent watertight compartments. Ordinarily the New Jersey will carry 900 tons of coal, but she will have a capacity for twice that amount for long cruises.

That she may strike her hardest blows in practically any direction without being obliged to change her course, the



THE SUPREME MOMENT AT THE LAUNCH.



PHOTOGRAPH OF NEW JERSEY, TAKEN IMMEDIATELY AFTER THE LAUNCH.

New Jersey has two double-decked turrets, one forward of the superstructure and the other aft, each having a total "arc of train," as the gunner calls it, of 270°. In the lower part of each of these turrets are two 12-in. guns, 40 calibers long; in the upper part of each—technically known as superposed turrets—are two 8-in. guns, 45° in length. Besides these are two so-called broadside turrets, one on either side of the vessel just forward of the midship line, and four more 8-in. pieces are divided between these, with a total "arc of train" of 180°. The broadside battery, on the gun deck, consists of twelve 6-in., 50-caliber, rapid-fire guns, mounted six on a side, and the secondary battery includes twelve 3-in., rapid-fire pieces, twelve 8-pounder semi-automatics, eight 1-pounder heavy automatics, two 30-caliber machine guns and six 30-caliber Colt automatic, distributed in various commanding positions about the ship, even to the crow's nest on the two masts, which, in a modern steel man-of-war, take the place of the fighting tops of the old-timer. In addition the New Jersey will also be fitted with submerged torpedo tubes.

As has been suggested, a battleship of this new type is practically a floating fortress, and she is so armored as to form a citadel, or redoubt, within which the ship's vitals and her broadside guns will be located. Along the water line there is a belt of steel armor 8 ft. wide amidships and 11 in. thick at the top and 8 in. at the bottom, tapering to a uniform thickness of 4 in. at bow and stern. Rising from the top of this main belt and extending to the upper, or main deck is a casement armored belt, with a uniform thickness of 6 in., running 245 ft. of the vessel's length and joined at its after end to the barrette, or foundation, of the main turret by a 6-in. armor bulkhead, while at its forward end it is met by a similar bulkhead extending from side to side of the vessel.

Within this citadel, and extending from one of the big turrets to the other, light armor, 1½ in. and 2½ in. will form subdivisions for the gun enclosures. These steel walls are to protect the gun crews from flying splinters and fragments of bursting projectiles. Ten inches of steel goes into the barbettes for the 12-in. turrets where they stand out beyond the citadel, within which the thickness is reduced to 7½ in. The turrets themselves will be protected by 12 in. of armor, while the 8-in. turrets will be covered with 6½-in. port plates.

AROUND THE GREAT LAKES

It has been decided not to send the steamer *Turbinia* to the coast for the winter. The steamer has been laid up at Hamilton.

A revision in colors of the chart of Lake Superior has just been issued and is now on sale at the office of the Marine Review.

A revision in colors of coast chart No. 6, Lake Erie, has been issued by the United States Lake Survey and is now for sale by the Marine Review.

The new Canadian revenue cutter *Vigilant*, designed to protect the Canadian fisheries on Lake Erie, is enroute to the lakes and will visit the ports of Buffalo, Cleveland and Detroit.

Capt. Harris W. Baker of Detroit purchased the steamer *Huron City* at Marseilles last week for \$11,800. During the winter the boat will be given a rebuild and converted into a wrecker.

The steamer *Edward Pease* was burned to the water's edge at Collinwood, Ont., last week. The vessel was loaded with coal, part of which was destroyed. The *Pease* was owned by C. P. Gilchrist of Cleveland.

While leaving Au Sable with a cargo of lumber the steamer *Kongo* ran on a submerged pile, forcing a hole in her hull below the water line and causing her to sink to the bottom

a short distance outside the harbor. The *Kongo* is owned by the H. M. Loid Sons Co. of Oscoda.

The Oliver Iron Mining Co. has placed an order for eight Bucyrus steam shovels for delivery next spring. The company also has an option of six additional shovels. This large order is in accord with the general policy of extensive preparation for next season's mining operations.

A hearing was held last week by government engineers at Toledo in the case of building another passenger bridge across the Maumee river. President William Livingstone and Mr. Harvey D. Goulder, counsel for the Lake Carriers' Association, protested against the building of the structure.

The Canadian revenue cutter *Petrel* which has been guarding the Canadian fisheries on Lake Erie for several years will be sent to the maritime provinces to take the place of the *Kingfisher*. The *Petrel* will be replaced by the new cutter *Vigilant* which has nearly once again the speed of the *Petrel*.

Engines for nine of the big steamers for which the American Ship Building Co. has contracts are under construction at the works of the Detroit Ship Building Co., Detroit, Mich. The largest of them is a 3,000 H. P. engine for the new Anchor Line passenger steamer which is building at Cleveland.

While crossing the river from Port Huron to Sarnia last week the Briggs night ferry boat upset when within 100 ft. of the Sarnia dock throwing the seven occupants into the water. Four of the passengers were drowned but two other passengers and the ferryman were rescued. The weather was rough and it is claimed that the small boat was overloaded.

It is announced that M. Rabbitt, Sons & Co. of Toledo, contractors of the new St. Clair Flats canal, will build an additional hydraulic dredge to put upon the work. The firm has acquired slips at Algonac and will construct the hull, which will be of wood, at that place during the winter. It is expected that a contract for the machinery will be closed shortly.

The Lake Superior Contracting & Dredging Co. is operating two 20-in. hydraulic dredges especially equipped for handling clay, gravel and all kinds of dredgable material. The operating office of the company is at Superior, Wis., and is in charge of Mr. E. T. Williams, manager. The company is prepared at any minute to do any kind of work involving dredging.

The northwest wind, which kicked up a big sea on the south shore of Lake Erie this week, raised the water in Sandusky harbor considerably and released the steamer *Edwards* and barge *Crete* which had been aground there for a number of days. It was found that the *Crete* was on a rock in the middle of the channel. The *Edwards* which was loaded with coal for Green Bay immediately sailed for that port.

A question of considerable interest to grain shippers and vesselmen has just been investigated by a Duluth vessel broker. It is whether Canadian wheat may be taken in American bottoms and held afloat for the winter at Buffalo. It was found that this may be done by bonding the cargoes and putting United States inspectors in charge of the vessels. It is likely that some Canadian wheat may be handled that way this winter.

The naval board appointed to select a training station on the great lakes has unanimously recommended that the Lake Bluff site thirty miles north of Chicago be selected and it is announced that the president has approved the selection. This puts an end to a controversy which has raged upon the lake cities for the past two years. The naval board has been quite sensible indeed in selecting a site for it at a suburb. The idea advanced by some cities that the station should be established within their city limits was observed. Land within the corporate limits of the city is too valuable for such a purpose.

The drill boat Cyclone owned by the Dunbar & Sullivan Wrecking Co. of Buffalo sunk at her dock at Amherstburg last week. The crew at the time were cleaning the boiler and getting ready for another week's work. The drill naturally lies low in the water and a big wave boarded the deck and partially filled the hull. She began to settle, and as there was not sufficient steam in the boiler the pumps could not be started. Before help could be secured the Cyclone plunged to the bottom. James Hancock, the foreman, who was aboard, was pulled into the cabin by the suction of intruding water and for a time it looked as though he would be drowned. However, he was safely rescued.

Henry Bloecker, local inspector of boilers, Grand Haven, Mich., and Thomas Honner, inspector of hulls at the same place, have both been dismissed from service by Secretary Metcalf for having reported the inspection of a yacht which had long been out of commission and which was aground and partially filled with water. The fact that the pay which the local inspectors receive is based upon the number of vessels inspected by them during the year is undoubtedly responsible for the inspection of this vessel by the inspectors. Secretary Cortelyou, while he was at the head of the department of commerce and labor, denounced this system as putting a premium on laxity and of making to the personal advantage of the inspectors to pass upon as many vessels as possible. He therefore recommended that all inspectors be placed upon a salary basis.

The wreck of the freight steamer Philip Minch which was burned off Sandusky Harbor on the night of Nov. 19 has been found and located by the United States steamer Visitor from information furnished by Capt. Bismiller of the fishing tug Thistle of Sandusky. Nothing of the vessel shows above water except a broken spar. A buoy carrying a red flag was placed along the side but neither this nor the spar will remain in position long. The vessel lies in 45 ft. of water eight miles east from the Middle Island lighthouse and almost exactly on the line between Huron lighthouse and Point Pelee spit. The loss of the Minch was dramatic in every way. The blaze started in the stern of the vessel and had gained considerable headway before being discovered. The crew of seventeen men were forced to abandon the steamer without even having time to dress, and reached the shore with the assistance of the Marblehead life saving crew. As they were all aroused from sleep by the general alarm they lost everything they possessed. The steamer was owned by the Nicholas Transit Co. of Cleveland and was managed by William Gerlach. She was built in Cleveland in 1888 and was 275 ft. long, 41 ft. beam and 22 ft. deep.

PERSONAL

Mr. Willard N. Sawyer, the Pittsburg agent of the Wellman-Seaver-Morgan Engineering Co., has been appointed general manager of the Lake Superior Corporation to succeed the late Cornelius Shields.

Mr. John M. Mulrooney, who established the Marine Review in 1890 and who has been all his life identified with lake affairs, has been elected president of the Great Lakes Register. The Great Lakes Register is a classification society and is to the lakes what Lloyd's is to the ocean.

Col. Frank J. Hecker of Detroit has resigned as a member of the Isthmian Canal Commission on account of the effect of the climate of the isthmus upon his health. His resignation was received by President Roosevelt with great regret because he regarded Col. Hecker's services as an executive upon the commission of inestimable value.

Capt. J. M. Fields, compass adjuster, who has been spending the spring and summer in compass adjustment on the lakes, will leave for San Francisco this week to spend the winter. He reports that his season on the lakes has been most success-

ful. He will first visit Washington and Newport News to negotiate for the sale of his compass corrector before leaving for the Pacific coast. He will be back in Cleveland by the opening of navigation next year.

AERIAL BRIDGE COMPLETED

Duluth, Nov. 30.—The famous high steel bridge over the harbor entrance of Duluth was finally connected and formed a complete structure on Monday of this week. The first complete chord was made the Tuesday before, and the lumber ship Kalkaska was the first ship to sail beneath it. The bridge will now be riveted up, the false work knocked away and the car hung, and the people of Duluth will shortly have an opportunity to ride on a structure similar to nothing on this continent, but exceedingly well adapted for its purposes nevertheless. It is to cost the city \$100,000, but will probably represent an investment of considerably more to somebody.

OBITUARY

Rear Admiral John R. Bartlett, U. S. navy, retired, of Lonsdale, R. I., died in St. Louis last week from pneumonia. He had been in St. Louis but a few days, having been appointed by Secretary Metcalf on Oct. 27 to investigate the methods of steamboat inspection in the Mississippi steamboat inspection district. His appointment with that of five other naval officers who were investigating other districts was made in accordance with instructions from President Roosevelt issued as a result of the Slocum disaster in New York harbor. Mr. Bartlett was born in New York on Sept. 26, 1843. He served throughout the civil war with credit.

TRADE NOTES

The American Ship Windlass Co., Providence, R. I., supplied the training ship Boxer recently launched at the Portsmouth navy yard with a steel windlass and hand capstan and the battleship Connecticut with one of their large naval windlasses for 23½-in. chain.

A. S. Cameron Steam Pump Works, foot of East 23d street, New York, has just issued a miniature catalogue which is a reproduction in part of their recent catalogue. The little catalogue is extremely interesting and designed with much taste. It gives in brief a great deal of information contained in the general catalogue. Anyone interested in steam pumps will do well to write for this little booklet because it is compactly compiled and is of size convenient for the pocket.

Borden & Selleck Co., 48 Lake street, Chicago, have recently gotten out a new catalogue describing their freight handling machinery, for carrying and elevating boxes, barrels, bales, packages, etc., which they have designated "booklet Number 6." This catalogue is particularly interesting to marine men, because of the half tones, blue prints and other data contained therein descriptive of installations of their freight conveyors which have been installed in several warehouses and docks, for facilitating the loading and unloading of boats. The company advises us that they will be glad to send this catalogue to any parties interested in such machinery.

The Maritime Stores Co., 38 Atlantic ave., Lewis wharf, Boston, which began business some months ago is composed of practical marine men. The company consists of Capt. H. J. Howes, James Otis Porter and Hollis Burgess. Capt. Howes is a deep sea mariner having sailed around the world several times. He was in the Mediterranean fruit trade for several years and his acquaintanceship extends to nearly every port. Mr. Porter is a naval architect and was formerly in the United States navy. Mr. Burgess was in the yacht brokerage and insurance business for a number of years. The company has a private landing at Lewis wharf and has launches running to all parts of the bay.



VOL. XXX.

CLEVELAND, O., DECEMBER 1, 1904.

No. 22.

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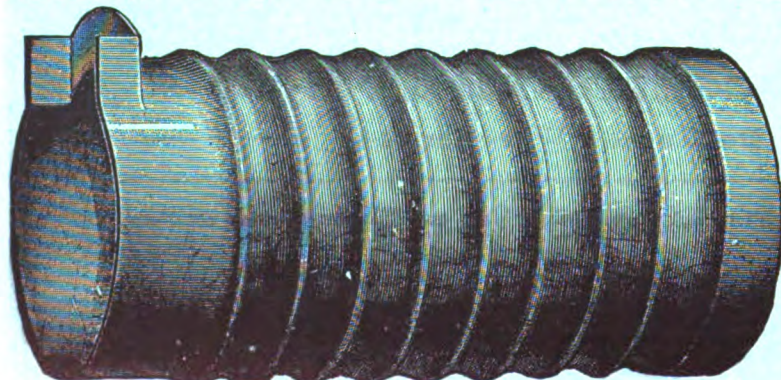
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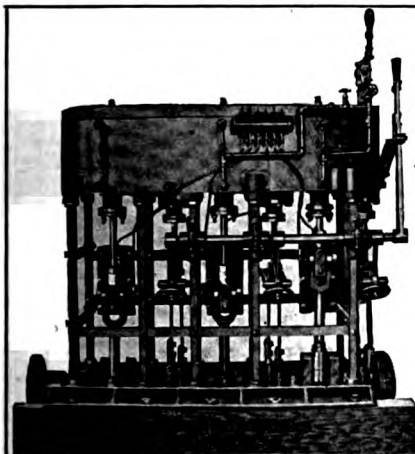
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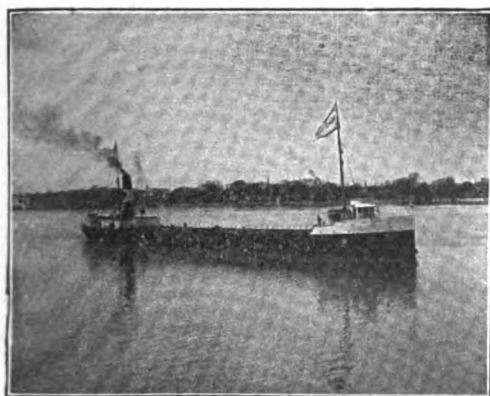
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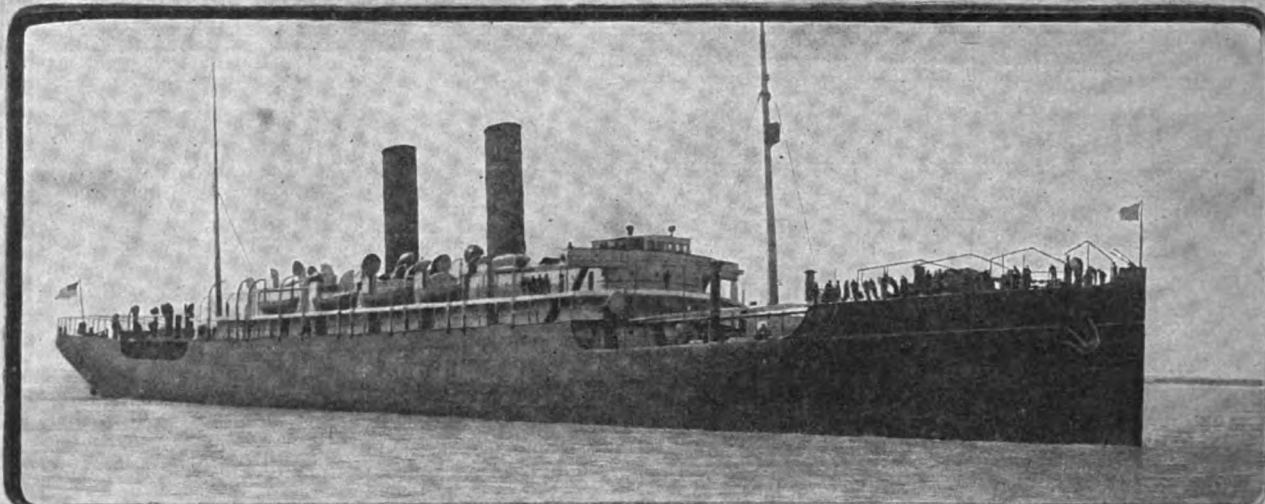
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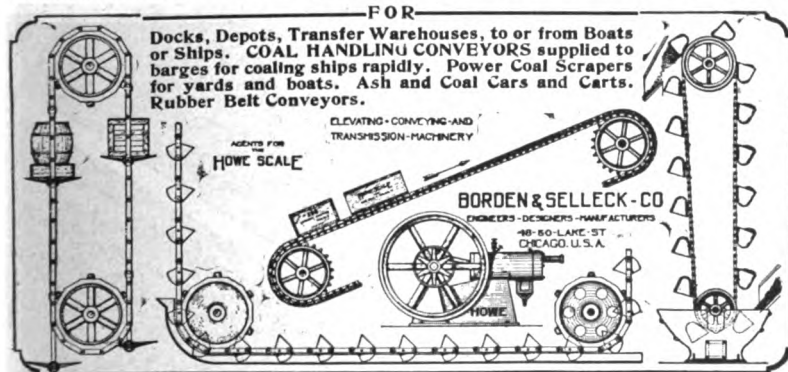
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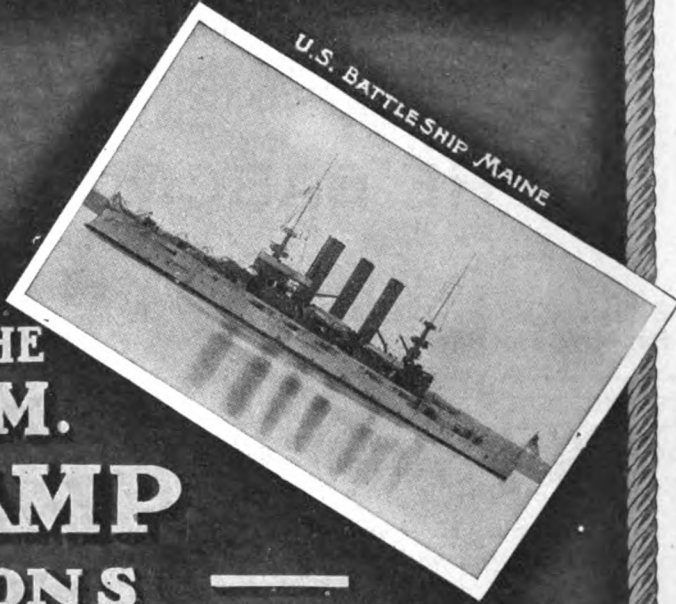
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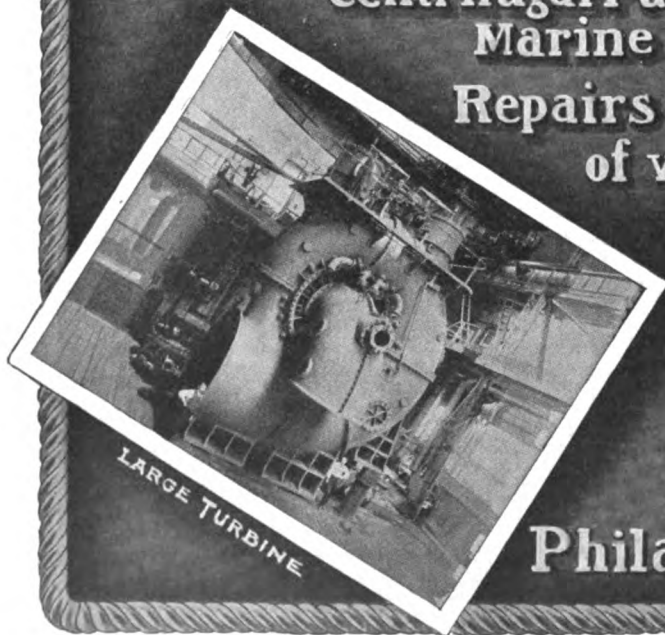
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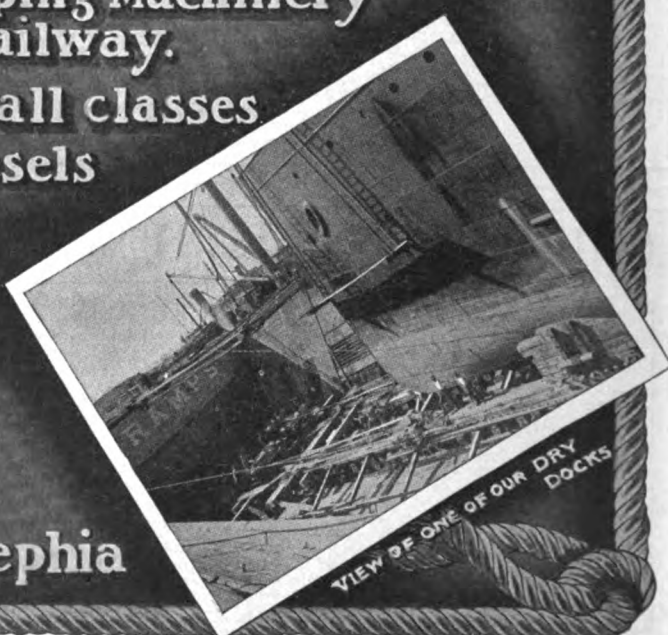
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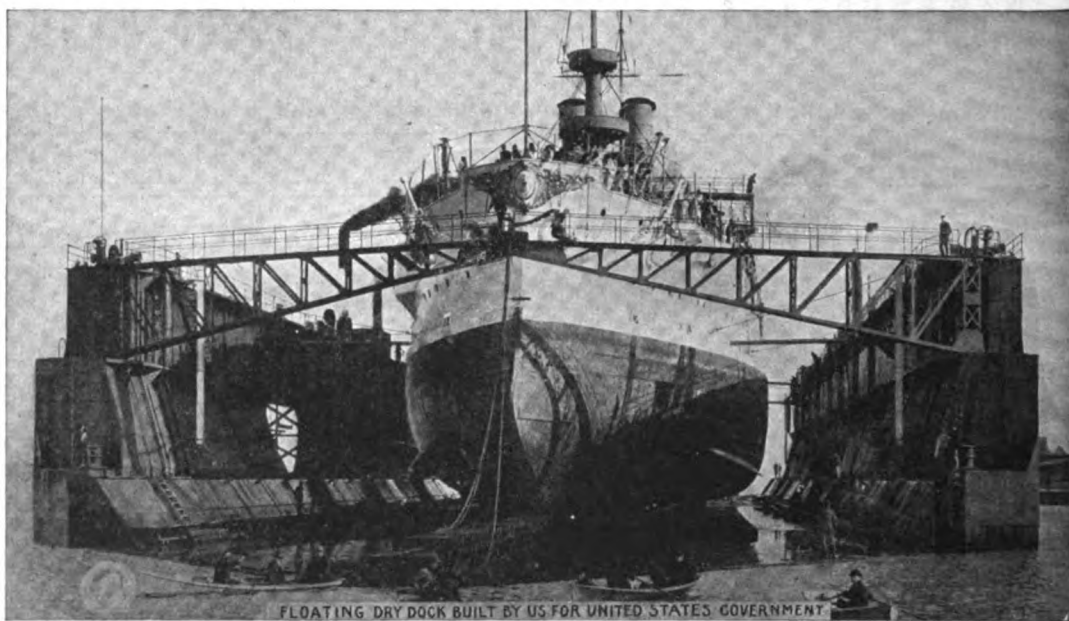
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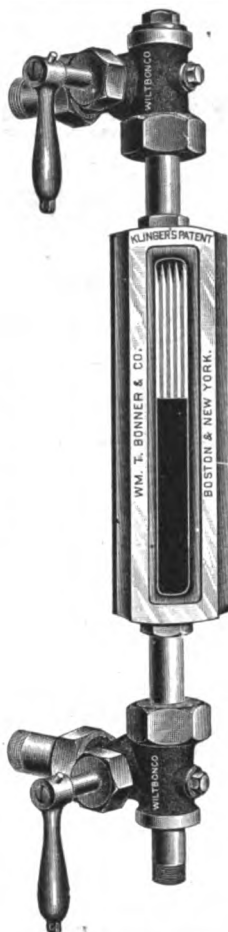
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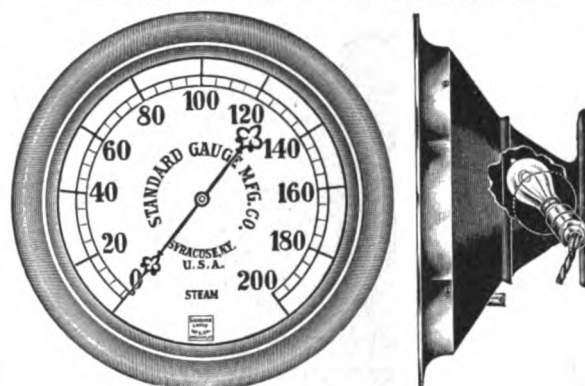
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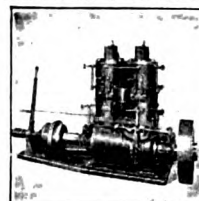
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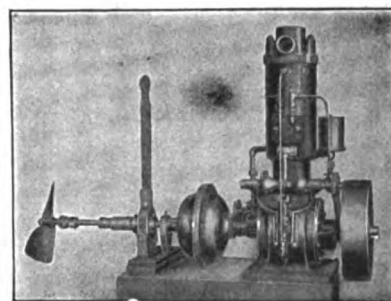
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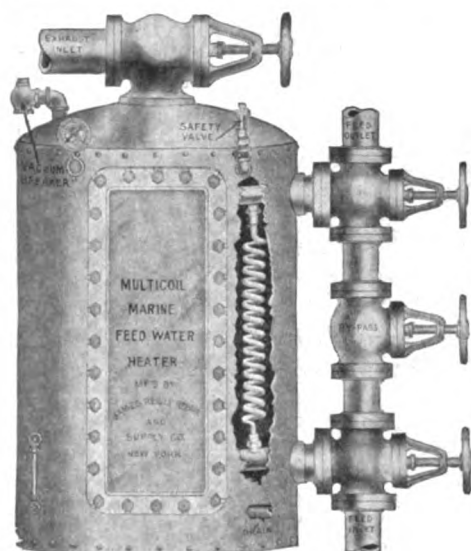
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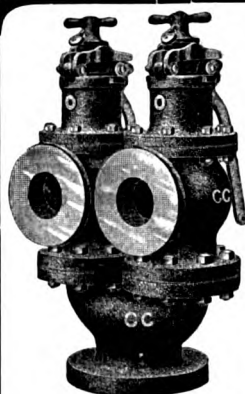
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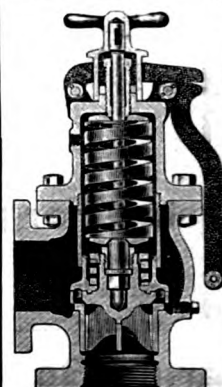
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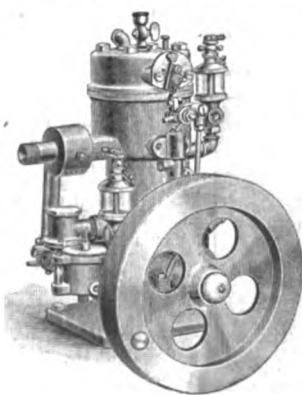
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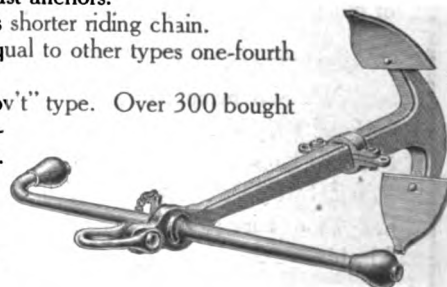
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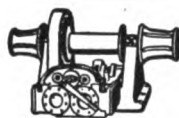
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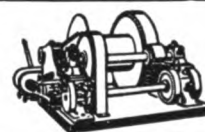
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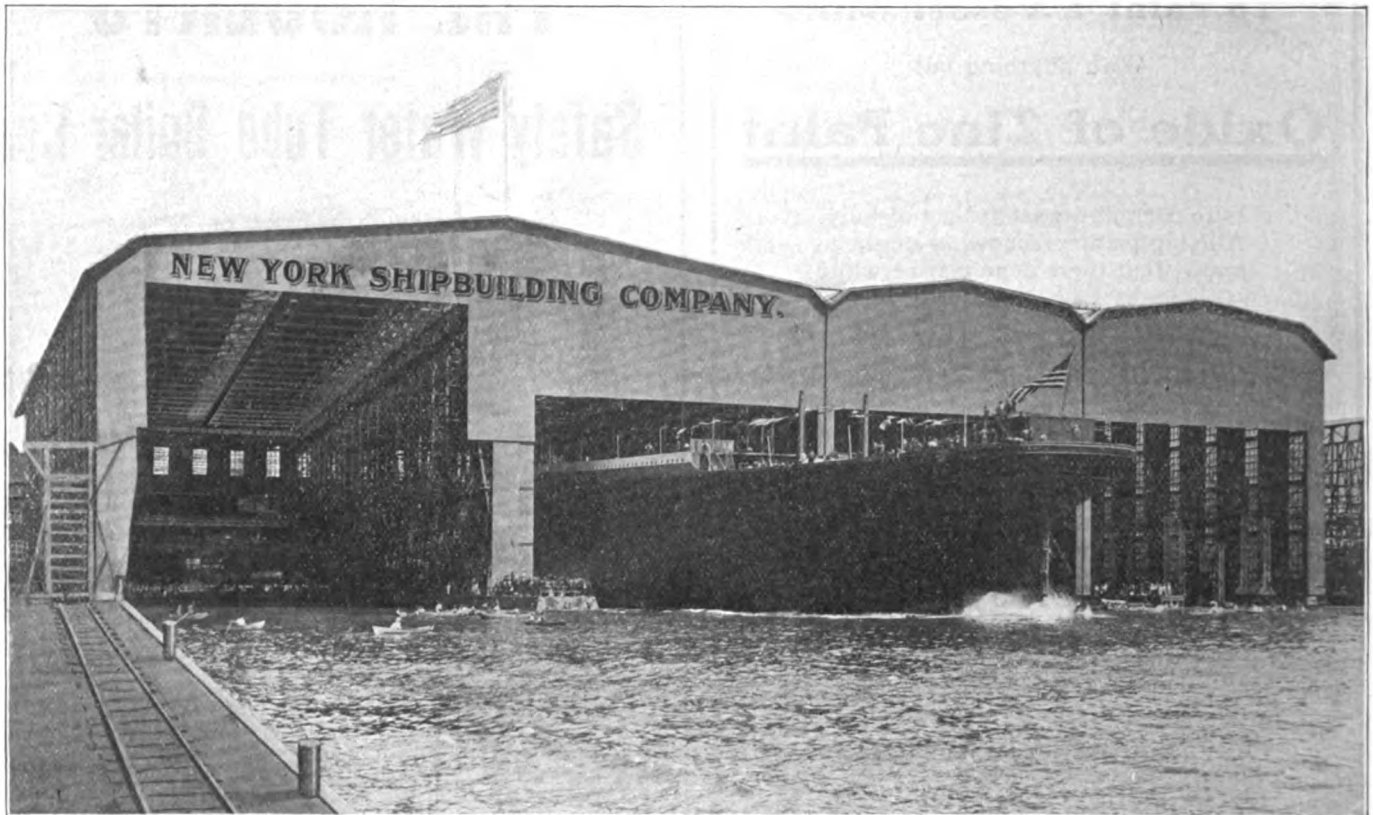
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**Pneumatic and Electric Tools;
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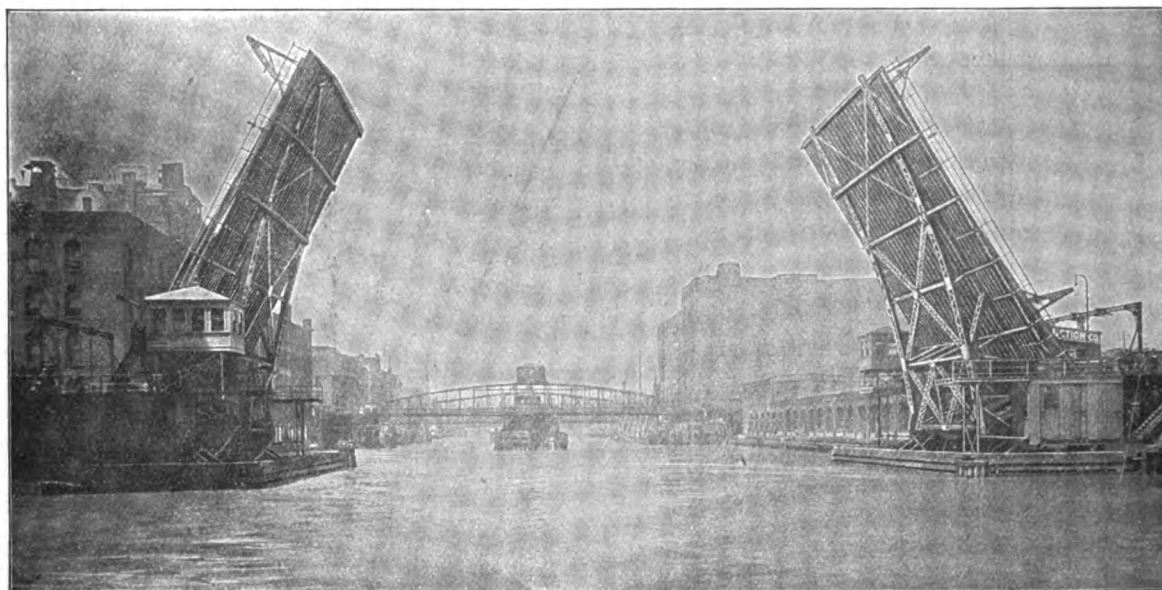
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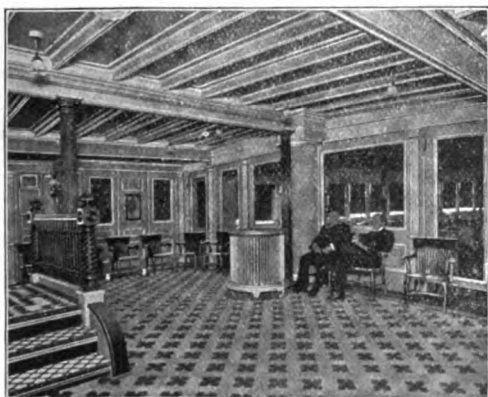
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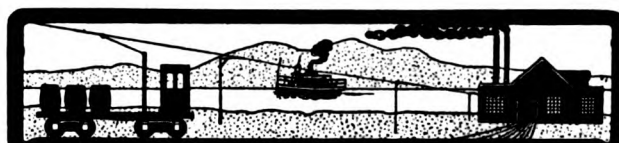
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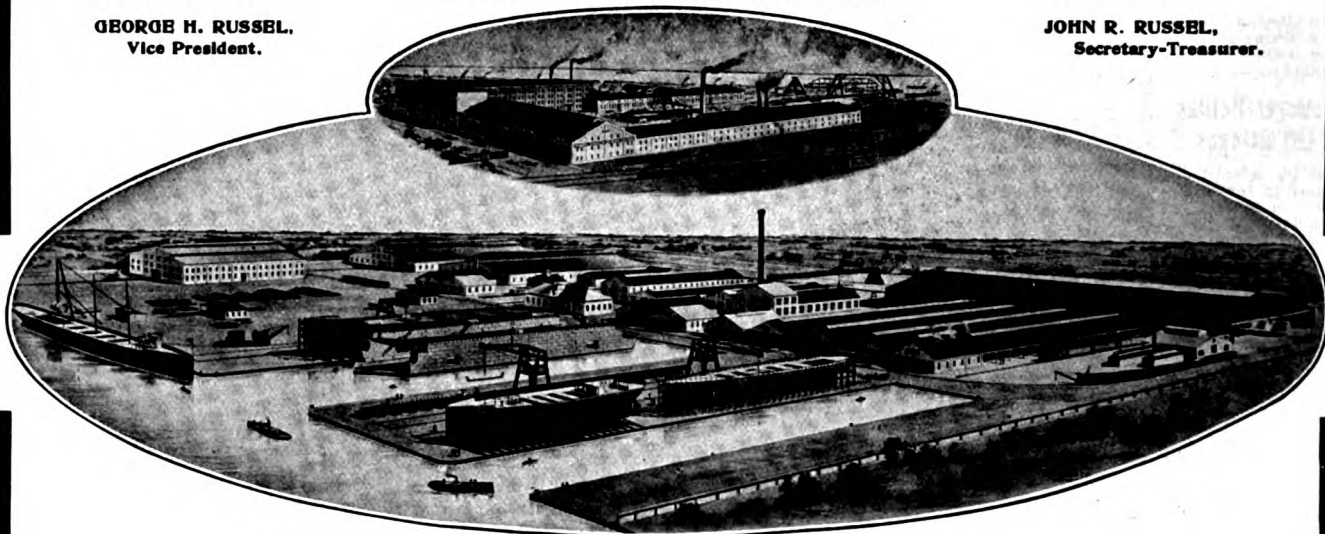
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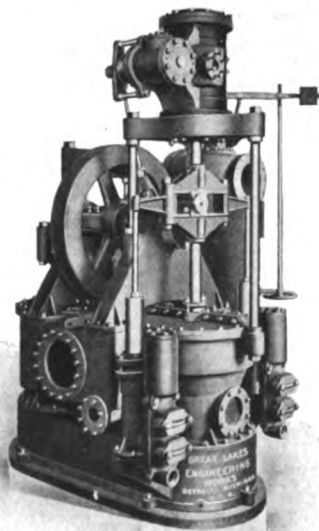
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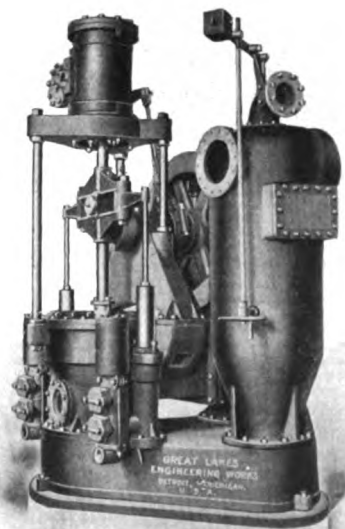
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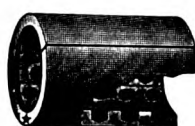
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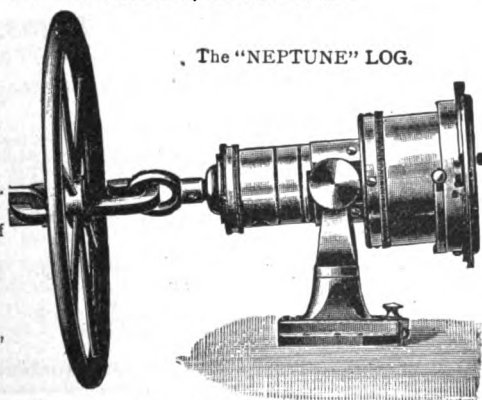
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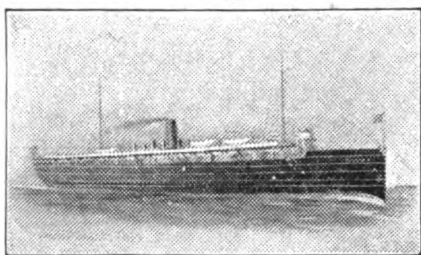
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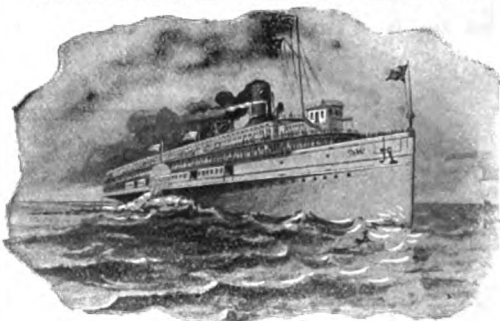
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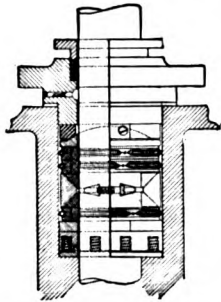
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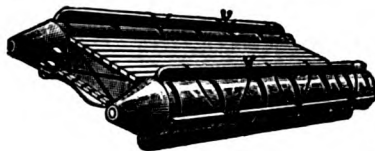
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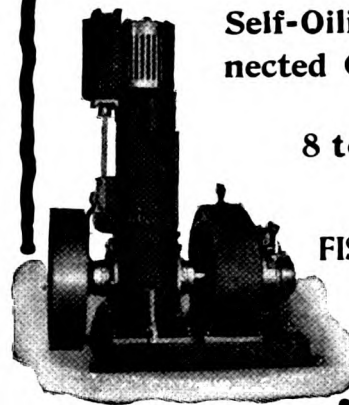
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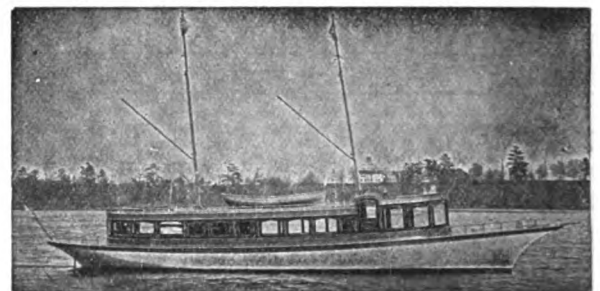
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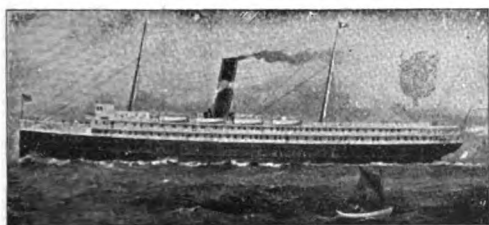
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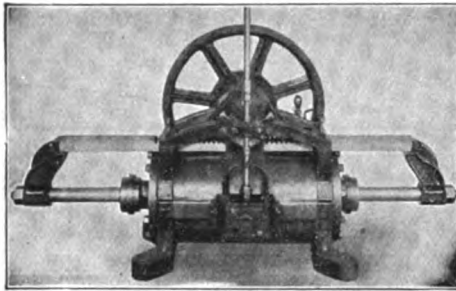
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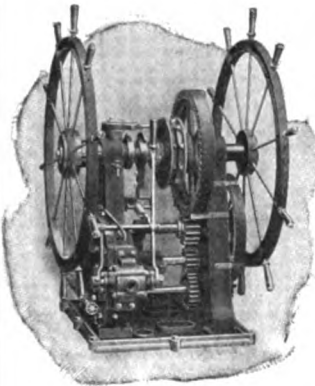


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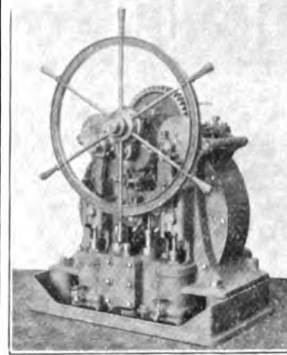
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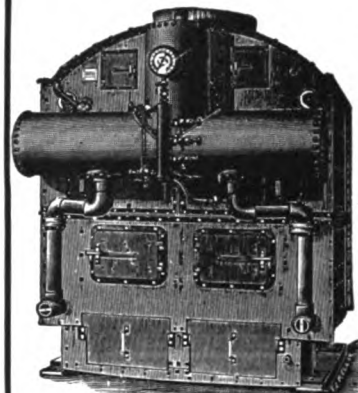
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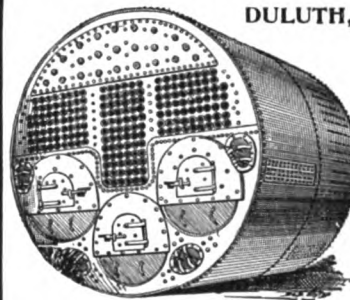
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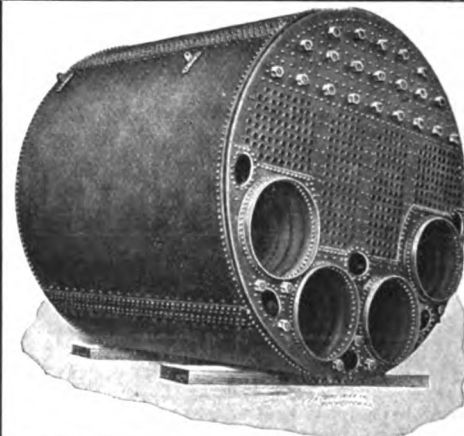
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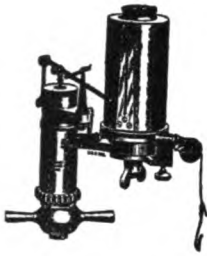


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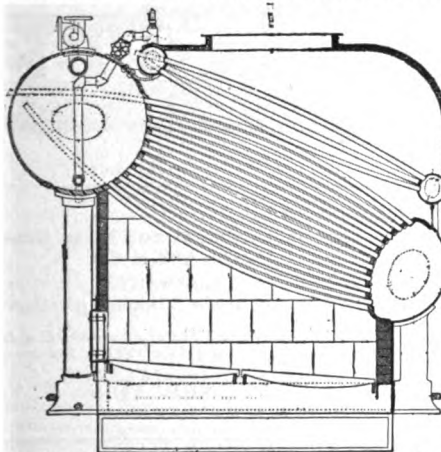
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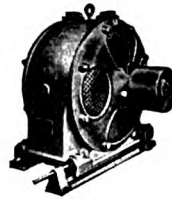
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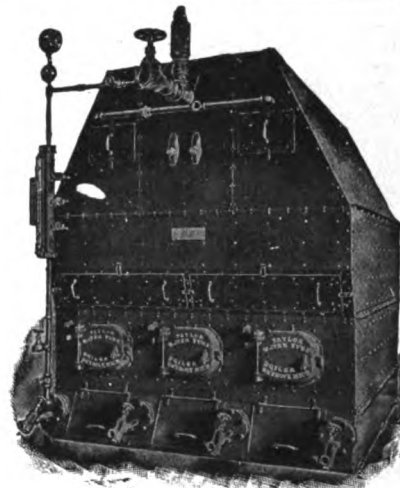
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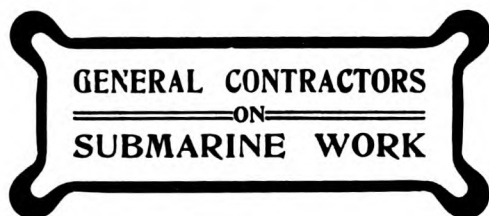
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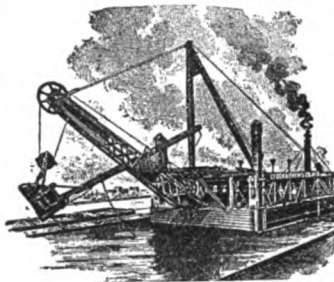
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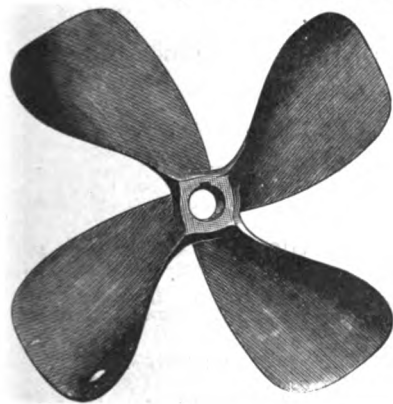
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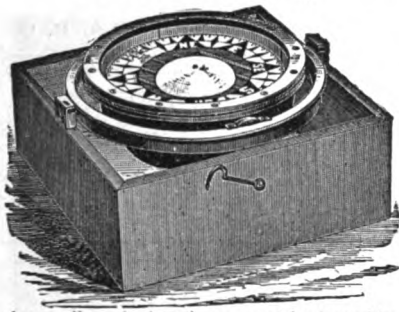
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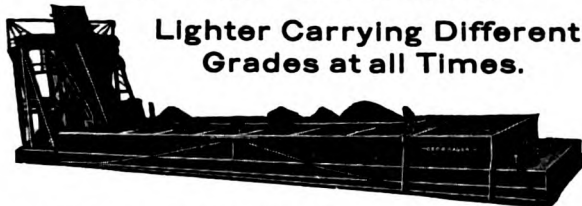
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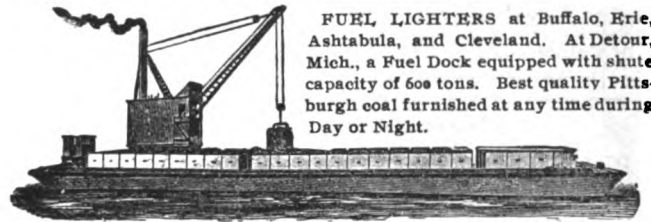
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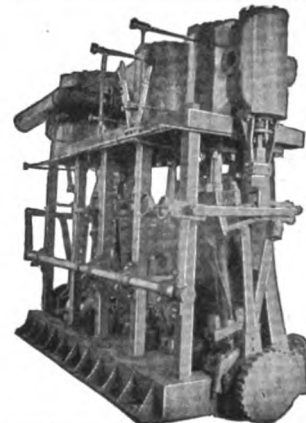
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Lunkenheimer Co.....Cincinnati.
Standard Gauge Mfg. Co.....Syracuse, N. Y.

GAUGES, WATER.

Bonner & Co., Wm. T.....Boston.
Lunkenheimer Co.....Cincinnati.
Standard Gauge Mfg. Co.....Syracuse, N. Y.

GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

HAMMERS, STEAM.

Chase Machine Co.....Cleveland.

HEATING APPARATUS.

Sturtevant, B. F. Co.....Hyde Park, Mass.

HOISTS FOR CARGO, ETC.

American Ship Building Co.....Cleveland.
Brown Hoisting Machinery Co. (Inc.).....Cleveland.
Chase Machine Co.....Cleveland.
General Electric Co.....New York.
Georgian Bay Engineering Works.....Midland, Ont.
Hyde Windlass Co.....Bath, Me.
McMyler Mfg. Co.....Cleveland.
Marine Iron Co.....Bay City.
Mietz, Aug.New York.
Pawling & Harnischfeger.....Milwaukee.
Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co., Cuyahoga Falls, O.

HOSE, RUBBER.

New York Belting & Packing Co.....New York.

HYDRAULIC DREDGES.

Great Lakes Engineering Works.....Detroit.

HYDRAULIC TOOLS.

Watson-Stillman Co., The.....New York.

ICE MACHINERY.

Great Lakes Engineering Works.....Detroit.
Roelker, H. B.....New York.

INDICATORS FOR STEAM ENGINES.

American Steam Gauge Co.....Boston.
Ashton Valve Co.....Boston.

INJECTORS.

American Injector Co.....Detroit.
Crane Co.....Chicago.
Jenkins Bros.....New York.
Lunkenheimer Co.....Cincinnati.
Penberthy Injector Co.....Detroit, Mich.

INSURANCE, MARINE.

Elphicke, C. W. & Co.....Chicago.
Fleming & Co., P. H.....Chicago.
Frankfort Marine, A. & P. G. Ins. Co.....New York.

INSURANCE, MARINE—Continued.

Gilchrist & Co., C. P.....Cleveland.
Hawgood & Co., W. A.....Cleveland.
Helm & Co., D. T.....Duluth.
Hutchinson & Co.....Cleveland.
McCarthy, T. R.....Montreal.
McCurdy, Geo. L.....Chicago.
Mitchell & Co.....Cleveland.
Parker Bros. Co., Ltd.....Detroit.
Peck, Chas. E. & W. F. New York & Chicago.
Prindiville & Co.....Chicago.
Richardson, W. C.....Cleveland.
Sullivan, D. & Co.....Chicago.
Voss, F. D.....New York.

IRON CASTINGS.

Reading Iron Co.....Reading, Pa.

IRON ORE AND PIG IRON.

Bourne-Fuller Co.....Cleveland, O.
Hanna, M. A. & Co.....Cleveland.
Picklands, Mather & Co.....Cleveland.
Reading Iron Co.....Reading, Pa.

LAMPS, INCANDESCENT.

Westinghouse Elec. & Mfg. Co.....Pittsburg, Pa.
Sawyer-Man Electric Co.....Pittsburg, Pa.

LAUNCHES—STEAM, NAPHTHA, ELECTRIC.

Georgian Bay Engineering Works.....Midland, Ont.
Marine Construction & D. D. Co.....Mariner's Harbor, S. I., N. Y.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P.....Chicago.

LIFE PRESERVERS, LIFE BOATS, BUOYS.

Armstrong, Cork Co.....Pittsburg.
Dreim, Thos. & Son.....Wilmington, Del.
Kahnweiler's Sons, D.....New York.

LIGHTS, SIDE AND SIGNAL.

Russell & Watson.....Buffalo.

LOGS.

Walker & Sons, Thomas.....Birmingham, Eng.
Also Ship Chandlers.

LUBRICATING GRAPHITE.

Dixon Crucible Co., Joseph.....Jersey City, N. J.

LUBRICATORS.

Crane Co.....Chicago.
Lunkenheimer Co.....Cincinnati.

LUMBER.

Martin-Barriss Co.....Cleveland.

MACHINISTS.

Chase Machine Co.....Cleveland.
Hickler Bros.....Sault Ste. Marie, Mich.
Lockwood Mfg. Co.....East Boston, Mass.
Macbeth Iron Co.....Cleveland.
Union Machine & Boiler Co.....Cleveland.

MACHINE TOOLS (WOOD WORKING).

Atlantic Works, Inc.....Philadelphia.

MARINE RAILWAYS.

Hickler Bros.....Sault Ste. Marie, Mich.

MARINE RAILWAYS, BUILDERS OF.

Crandall & Son, H. I.....East Boston, Mass.

MATTRESSES, CUSHIONS, BEDDING.

Fogg, M. W.....New York.

MECHANICAL DRAFT FOR BOILERS.

American Ship Building Co.....Cleveland.
Detroit Ship Building Co.....Detroit.
Great Lakes Engineering Works.....Detroit.
Sturtevant, B. F. Co.....Hyde Park, Mass.

METALLIC PACKING.

Katzenstein, L. & Co.....New York.

METAL POLISH.

Bertram's Oil Polish Co.....Boston.

MOTORS, GENERATORS—ELECTRIC.

Fisher Electrical Works.....Detroit.
General Electric Co.....Schenectady, N. Y.
Sturtevant, B. F. Co.....Hyde Park, Mass.
Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

Buyers' Directory of the Marine Trade.—Continued.

NAUTICAL INSTRUMENTS.

Ritchie, E. S., & Sons.....Brookline, Mass.

NAUTICAL SCHOOLS.

Chicago Nautical School.....Chicago.

NAVAL ARCHITECTS.

Hynd, Alexander.....Cleveland.
 Kidd, Joseph.....Duluth, Minn.
 Kreer & Parsons.....Chicago.
 Lovejoy, H. O.....Buffalo.
 Matteson & Drake.....Philadelphia.
 Mosher, Chas. D.....New York.
 Nacey, James.....Cleveland.
 Rice, Henry.....Buffalo.
 Sadler, Perkins & Field.....New York.
 Wood, W. J.....Chicago.

OAKUM.

DeGrauw, Aymar & Co.....New York.
 Stratford, Oakum Co.....Jersey City, N. J.

OIL ENGINES.

Mietz, Aug.....New York.

OILS AND LUBRICANTS.

Dixon Crucible Co., Joseph.....Jersey City, N. J.
 Standard Oil Co.....Cleveland.

PACKING.

Crane Co.....Chicago.
 Jenkins Bros.....New York.
 Katzenstein, L. & Co.....New York.
 New York Belting & Packing Co.....New York.

PACKING TOOL.

Matteson & Drake.....Philadelphia.

PAINTS.

Baker, Howard H. & Co.....Buffalo.
 Detroit Varnish Co.....Detroit.
 Detroit White Lead Works.....Detroit.
 New Jersey Zinc Co.....New York.
 Upson-Walton Co.....Cleveland.

PATTERN SHOP MACHINERY.

Atlantic Works, Inc.....Philadelphia.

PILE DRIVING AND SUBMARINE WORK.

Buffalo Dredging Co.....Buffalo.
 Chicago & Gt. Lakes Dredge & Dock Co.....Chicago.
 Dunbar & Sullivan Dredging Co.....Buffalo.
 Fitz-Simons & Connell Co.....Chicago.
 Hickler Bros.....Sault Ste. Marie, Mich.
 Lake Superior Contracting & Dredging Co.....Duluth, Minn.
 Parker Bros. Co., Ltd.....Detroit.
 Smith Co., L. P. & J. A.....Cleveland.
 Starke Dredge & Dock Co., C. H.....Milwaukee.
 Sullivan, M.....Detroit.

PIPE, WROUGHT IRON.

Bourne-Fuller Co.....Cleveland, O.
 Crane Co.....Chicago.
 Macbeth Iron Co.....Cleveland.
 Reading Iron Co.....Reading, Pa.

PLANING MILL MACHINERY.

Atlantic Works, Inc.....Philadelphia.

PLATES—SHIP, STRUCTURAL, ETC.

Bourne-Fuller Co.....Cleveland, O.
 Otis Steel Co.....Cleveland.
 Reading Iron Co.....Reading, Pa.

PNEUMATIC TOOLS.

Allen, John F.....New York.

POLISH FOR METALS.

Bertram's Oil Polish Co.....Boston.

PRESSURE REGULATORS.

Kieley & Mueller.....New York.
 Ross Valve Co.....Troy, N. Y.

PROPELLER WHEELS.

American Ship Building Co.....Cleveland.
 Atlantic Works.....East Boston, Mass.
 Cramp, Wm. & Sons.....Philadelphia.
 Detroit Ship Building Co.....Detroit.
 Fore River Shipbuilding Co.....Quincy, Mass.
 Great Lakes Engineering Works.....Detroit.
 Hyde Windlass Co.....Bath, Me.
 Jenks Ship Building Co.....Port Huron, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.
 Macbeth Iron Co.....Cleveland.
 Milwaukee Dry Dock Co.....Milwaukee.
 Newport News Ship Building Co.....Newport News, Va.
 Roelker, H. B.....New York.
 Sheriffs Mfg. Co.....Milwaukee.
 Superior Ship Building Co.....Superior, Wis.
 Thropp & Sons Co., J. E.....Trenton, N. J.
 Trout, H. G.....Buffalo.

PROJECTORS, ELECTRIC.

General Electric Co.....Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

PUMPS FOR VARIOUS PURPOSES.

Blake, Geo. F., Mfg. Co.....New York.
 Great Lakes Engineering Works.....Detroit.
 Kingsford Foundry & Machine Works.....Oswego, N. Y.

PUNCHES, RIVETERS, SHEARS.

Allen, John F.....New York.

RANGES.

Russell & Watson.....Buffalo.

REFRIGERATING APPARATUS.

Great Lakes Engineering Works.....Detroit.
 Roelker, H. B.....New York.

REGISTER FOR CLASSIFICATION OF VESSELS.

Great Lakes Register.....Cleveland.
 Record of American & Foreign Shipping.....New York.

REPAIRS—ENGINE AND BOILER.

(See also Boiler Manufacturers and Engine Builders.)

Georgian Bay Engineering Works.....Midland, Ont.

RIVETING MACHINES.

Allen, John F.....New York.

RIVETS, STEEL FOR SHIPS AND BOILERS.

Bourne-Fuller Co.....Cleveland, O.

SAFETY VALVES.

American Steam Gauge & Valve Mfg. Co.....Boston.
 Ashton Valve Co.....Boston.
 Crane Co.....Chicago.
 Lunkenheimer Co.....Cincinnati.

SAIL MAKERS.

Baker, Howard H. & Co.....Buffalo.
 Upson-Walton Co.....Cleveland.

SALVAGE COMPANIES.

See Wrecking Companies.

SCHOOLS—NAVIGATION.

Chicago Nautical School.....Chicago.

SEARCH LIGHTS.

General Electric Co.....Schenectady, N. Y.
 Westinghouse Electric & Mfg. Co.....Pittsburg, Pa.

SHEARS.

See Punches, Rivets, and Shears.

SHIP AND BOILER PLATES AND SHAPES.

Bourne Fuller Co.....Cleveland, O.
 Otis Steel Co.....Cleveland.
 Reading Iron Co.....Reading, Pa.

SHIP BUILDERS.

American Ship Building Co.....Cleveland.
 Atlantic Works.....East Boston, Mass.
 Bertram Engine Works Co., Ltd.....Toronto, Can.
 Buffalo Dry Dock Co.....Buffalo.
 Cramp, Wm. & Sons.....Philadelphia.
 Craig Ship Building Co.....Toledo, O.
 Chicago Ship Building Co.....Chicago.
 Detroit Ship Building Co.....Detroit.
 Fore River Shipbuilding Co.....Quincy, Mass.
 Great Lakes Engineering Works.....Detroit.
 Jenks Ship Building Co.....Port Huron, Mich.
 Lockwood Mfg. Co.....East Boston, Mass.
 Maryland Steel Co.....Sparrows Point, Md.
 Milwaukee Dry Dock Co.....Milwaukee.
 Newport News Ship Building Co.....Newport News, Va.
 New York Shipbuilding Co.....Camden, N. J.
 Roach's Ship Yard.....Chester, Pa.
 Shipowner's Dry Dock Co.....Chicago.
 Smith & Son, Abram.....Algonac, Mich.
 Willard, Chas. P. & Co.....Chicago.

SHIP CHANDLERS.

Baker, Howard H. & Co.....Buffalo.
 Marine Mfg. & Supply Co.....New York.
 Upson-Walton Co.....Cleveland.

SHIP DESIGNERS.

Kidd, Joseph.....Duluth.
 Kreer & Parsons.....Chicago.
 Matteson & Drake.....Buffalo.
 Rice & Lovejoy.....Buffalo.
 Steel, Nacey & Hynd.....Cleveland.
 Wood, W. J.....Chicago.

SHIP LANTERNS AND LAMPS.

Russell & Watson.....Buffalo.

SHIP TIMBER.

Martin-Barriss Co.....Cleveland.

SMOOTH-ON COMPOUND, FOR REPAIRS.

Smooth-On Mfg. Co.....Jersey City, N. J.

STAYBOLTS, IRON OR STEEL, HOLLOW OR SOLID.

Falls Hollow Staybolt Co.....Cuyahoga Falls, O.
 Reading Iron Co.....Reading, Pa.

STEAM VESSELS FOR SALE.

Gilchrist & Co., C. P.....Cleveland.
 Holmes, Samuel.....New York.
 Lester, S. S.....Quebec, Can.
 McCarthy, T. R.....Montreal, Can.

STEAMSHIP LINES, PASS. AND FREIGHT.

American Line.....New York.
 Anchor Line.....Buffalo.
 Boston Steamship Co.....Boston.
 Cleveland & Buffalo Transit Co.....Cleveland.
 Detroit & Cleveland Line.....Cleveland.
 Erie & Western Trans. Co.....Buffalo.
 Goodrich Trans. Co.....Chicago.
 International Mercantile Marine Co.....Philadelphia.
 Manitou Steamship Co.....Chicago.
 Mexican-American S. S. Co.....New Orleans, La.
 New York & Cuba Mail S. S. Co.....New York.
 Niagara, St. Catharines & Toronto Ry. & Nav. Co.....St. Catharines, Ont.
 Northern Michigan Trans. Co.....Chicago.
 Red Star Line.....New York.
 Richelieu & Ontario Nav. Co.....Montreal, Can.
 United Fruit Co.....Boston.

STEEL CASTINGS.

Macbeth Iron Co.....Cleveland.
 Otis Steel Co.....Cleveland.

STEERING APPARATUS.

American Ship Building Co.....Cleveland.
 Chase Machine Co.....Cleveland.
 Dake Engine Co.....Grand Haven, Mich.
 Detroit Ship Building Co.....Detroit.
 Hyde Windlass Co.....Bath, Me.
 Jenks Ship Building Co.....Port Huron, Mich.
 Marine Mfg. & Supply Co.....New York.
 Moulton Steering Engine Co.....New York.
 Pawling & Harnischfeger.....Milwaukee.
 Sheriffs Mfg. Co.....Milwaukee.

SUBMARINE DIVING APPARATUS.

Morse & Son, A. J.....Boston.
 Schrader's Son, A.....New York.

SURVEYORS, MARINE.

Gaskin, Edward.....Buffalo.
 Hynd, Alexander.....Cleveland.
 Lovejoy, H. O.....Buffalo.
 Matteson & Drake.....Philadelphia.
 Parker Bros. Co., Ltd.....Detroit.
 Nacey, James.....Cleveland.
 Rice, Henry.....Buffalo.
 Steel, Adam.....Cleveland.
 Wood, W. J.....Chicago.

TESTS OF MATERIALS.

Hunt, Robert W. & Co.....Chicago.

TILING, INTERLOCKING RUBBER.

New York Belting & Packing Co.....New York.

TOOLS, METAL WORKING, FOR SHIP AND ENGINE WORKS.

Allen, John F.....New York.
 Watson-Stillman Co.....New York.

TOOLS, WOOD WORKING.

Atlantic Works, Inc.....Philadelphia.

TOWING MACHINES.

American Ship Windlass Co.....Providence, R. I.
 Chase Machine Co.....Cleveland.

TOWING COMPANIES.

Donnelly Salvage & Wrecking Co.....Kingston, Ont.
 Great Lakes Towing Co.....Cleveland.
 Midland Towing & Wrecking Co., Ltd.....Midland, Ont.

TRAPS, STEAM.

Kieley & Mueller.....New York.
 Sturtevant Co., B. F.....Hyde Park, Mass.

TRUCKS.

Boston & Lockport Block Co.....Boston.

TUBING, SEAMLESS.

Shelby Steel Tube Co.....Pittsburg, Pa.

-Continued.

VESSEL AND FREIGHT AGENTS—Con.

Hawgood & Co.,	W. A.	Cleveland.
Holmes, Samuel		New York.
Hutchinson & Co.		Cleveland.
Jester, S. S.		Quebec, Can.
McCarthy, T. R.		Montreal.
Mitchell & Co.		Cleveland.
Parker Bros. Co., Ltd.		Detroit.
Prindiville & Co.		Chicago.
Richardson, W. C.		Cleveland.
Sullivan, D. & Co.		Chicago.

WATER GAUGES.

Banner & Co. Wm. T. Boston

WIRE ROPE AND WIRE ROPE FITTINGS.

Baker, H. H. & Co......Buffalo.
DeGrauw, Aymar & Co......New York.
Upson-Walton Co......Cleveland.

WHISTLES. STEAM.

American Steam Gauge & Valve Mfg. Co.
Boston

WINDLASSES.

American Ship Windlass Co......Providence, R. I.
American Ship Building Co......Cleveland
Hyde Windlass Co......Bath, Me.
Jenks Ship Building Co.....Port Huron, Mich.
Marine Mfg. & Supply Co......New York

American Ship Windlass Co., Providence, R. I.
Georgian Bay Engineering Works.....
Midland, Ont.
Hyde Windlass Co.....
Bath, Me.

Atlantic Works, Inc......Philadelphia,

Donnelly Salvage & Wrecking Co..... Kingston, Ont.
Great Lakes Towing Co..... Cleveland, Ohio
Midland Towing & Wrecking Co., Ltd... Midland, Ont.
Parker Bros. Co., Ltd..... Detroit

Bertram Engine Works Co., Ltd..Toronto, Can.
Drein, Thos. & Son.....Wilmington, Del.
Georgian Bay Engineering Works.....
.....Midland, Ont.
Truscott Boat Mfg. Co.....St. Joseph, Mich.
Willard, Chas. P. & Co.....Chicago

Dreier, Thos. & Son.....Wilmington, Del.

MARINE REVIEW.

The star (*) indicates that the advertisement appears alternate weeks. For addresses see advertisements on pages noted.
The dagger (†) indicates that advertisement appears once a month.

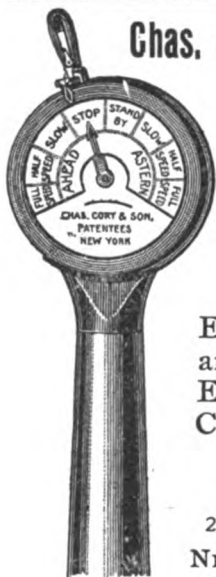
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Borden & Selleck Co.	7	Great Lakes Engineering Works	16	Marine Iron Works	3	Sheriffs Mfg. Co.	45
*Boston & Lockport Block Co.	35	Great Lakes Register	42	*Marine Mfg. & Supply Co.	38	Shipowners' Dry Dock Co.	39
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*Camden Anchor-Rockland Mach-		Helm & Co., D. T.	48	Mitchell & Co.	48	Starke Dredge & Dock Co., C. H.	44
ine Co.	12	Hickler Bros.	44	Morse & Son, A. J.	54	Stirling Co.	9
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Cleveland & Buffalo Transit Co.	36	Hyde Windlass Co.	56	Dry Dock Co.	6	Taylor Water-Tube Boiler Co.	41
Continental Iron Works	2	Hynd, Alexander	49	New Jersey Zinc Co.	13	Thropp, J. E., & Sons Co.	54
Cory, Chas. & Son	54			New York Belting & Packing Co.	15	Trout, H. G.	45
*Craig Ship Building Co.	5			New York & Cuba Mail S. S. Co.	37	Truscott Boat Mfg. Co.	38
Cramp, Wm. & Sons, S. & E. B.				New York Shipbuilding Co.	14		
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*Crandall & Son, H. I.	3			Northern Mich. Trans. Co.	36		
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				Mfg. Co.	40		
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Drein, Thos., & Son	40	Kreer & Parsons.	49	Potter & Potter.	49	Wood, W. J.	49
Dunbar & Sullivan Dredging Co.	44	Kremer, C. E.	48	Potter, J. D.	38	Woodhouse Chain Works.	49
				Powell, Ambrose V.	49		
				Prindville & Co.	48		

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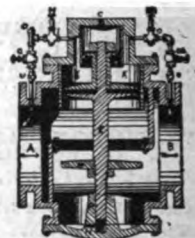
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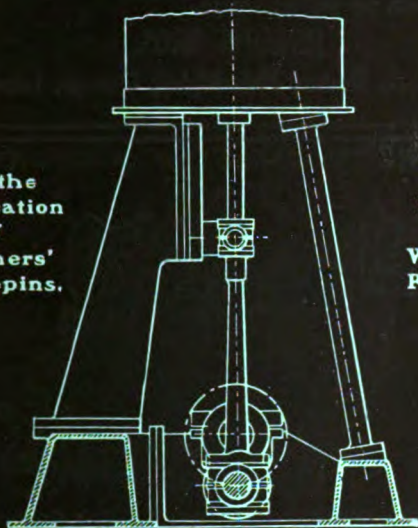
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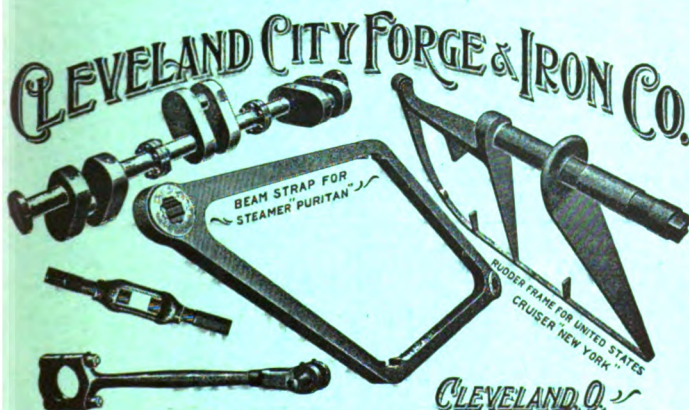
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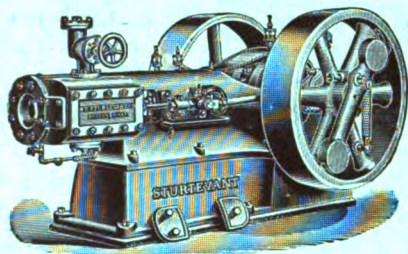
LAKE SHORE AND MICHIGAN SOUTHERN RY.

Eastward	Arrive from West	Depart East
No. 18, Southwestern Limited .....	.....	*1:50 a.m.
No. 22, Lake Shore Limited	*2:12 a.m.	*2:20 a.m.
No. 20, Chicago and Cleveland Exp.	*7:20 a.m.	.....
No. 28, New York and Boston Exp.	*7:40 a.m.	*8:00 a.m.
No. 40, Toledo and Buffalo Accom.	†10:00 a.m.	†10:30 a.m.
No. 32, Fast Mail	*11:25 a.m.	*11:30 a.m.
No. 48, Accommodation via Sandusky	†1:40 p.m.	.....
No. 42, Boston-New York Express .....	.....	*11:45 a.m.
No. 44, Cleveland and New York Spl. ....	.....	*3:00 p.m.
No. 46, Southwestern Express .....	.....	*3:10 p.m.
No. 116, Ashtabula Accommodation. ....	.....	†4:30 p.m.
No. 6, Limited Fast Mail	*5:40 p.m.	*5:45 p.m.
No. 26, 20th Century Limited	*7:40 p.m.	*7:43 p.m.
No. 10, Chicago, N.Y. & Boston Spl.	*7:30 p.m.	*7:50 p.m.
No. 16, New England Express	*10:30 p.m.	*10:35 p.m.
No. 2, Day Express	†9:10 p.m.	†9:25 p.m.
No. 126, Norwalk Accommodation	†7:55 a.m.	.....
Westward	Arrive from East	Depart West
No. 7, Exposition Limited	*12:50 a.m.	.....
No. 11, Southwestern Limited	*2:55 a.m.	.....
No. 9, Day Express .....	.....	†6:10 a.m.
No. 15, Boston and Chicago Special.	*3:10 a.m.	*3:15 a.m.
No. 19, Lake Shore Limited	*7:15 a.m.	*7:25 a.m.
No. 23, Western Express	*10:30 a.m.	*10:35 a.m.
No. 29, Southwestern Special	†11:10 a.m.	.....
No. 33, Southwestern Express	*12:25 p.m.	.....
No. 133, Cleveland and Detroit Exp. ....	.....	*12:45 p.m.
No. 47, Accommodation	†11:00 a.m.	†3:00 p.m.
No. 141, Sandusky Accommodation. ....	.....	†3:10 p.m.
No. 43, Fast Mail	*4:35 p.m.	*4:40 p.m.
No. 127, Norwalk Accommodation .....	.....	†5:10 p.m.
No. 37, Pacific Express	*6:50 p.m.	*7:20 p.m.
No. 3, Fast Mail Limited	*10:50 p.m.	*10:55 p.m.
No. 115, Ashtabula Accommodation.	*8:30 a.m.

*Daily. †Except Sunday. ‡Except Monday.
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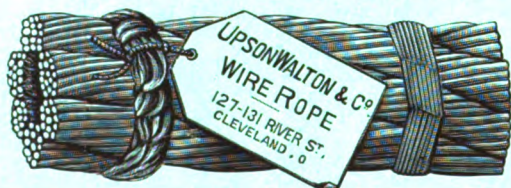
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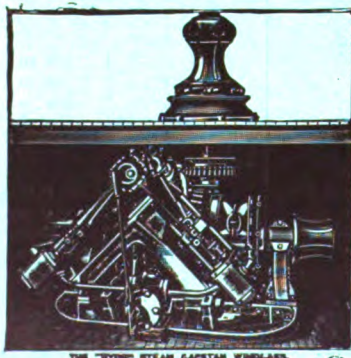
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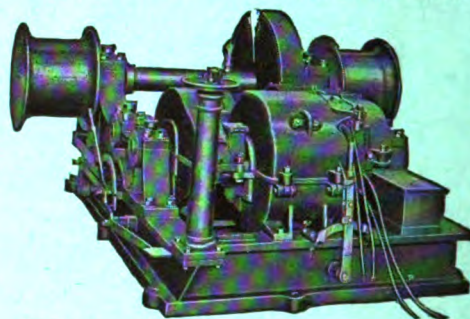
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